issued 9/22/92

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

September 8, 1992

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

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

Dear Mr. Conway:

SUBJECT: ISSUANCE OF AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION UNIT NO. 1 (TAC NO. M80905), UNIT NO. 2 (TAC NO. M80906), AND UNIT NO. 3 (TAC NO. M80907)

The Commission has issued the enclosed Amendment No. 64 to Facility Operating License No. NPF-41, Amendment No. 50 to Facility Operating License No. NPF-51, and Amendment No. 37 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 June 25, 1991.

These amendments delete the Iodine Removal System from Technical Specifications 3/4 3.6.2.2 for Units 1, 2, and 3. The Iodine Removal System uses hydrazine as an additive to the containment spray system at Palo Verde. The removal of the hydrazine additive from the containment spray system will not result in a significant increase in post-Loss of Coolant Accident (LOCA) doses outside of containment.

A copy of the related Safety Evaluation is also enclosed. A notice of issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Catherine M. Thompson

Catherine M. Thompson, Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 64 to NPF-41
2. Amendment No. 50 to NPF-51
3. Amendment No. 37 to NPF-74
4. Safety Evaluation

cc w/enclosures:
See next page

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Reissued 9/22/92

September 8, 1992

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

SUBJECT: ISSUANCE OF AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION UNIT NO. 1 (TAC NO. M80905), UNIT NO. 2 (TAC NO. M80906), AND UNIT NO. 3 (TAC NO. M80907)

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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.64
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 June 25, 1991, 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:

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(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 64, 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 must be fully implemented no later than 45 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R. Quay

Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 8, 1992

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 64 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 vertical lines indicating the areas of change.

Remove	Insert
VII	VII
3/4 6-17	3/4 6-17
3/4 6-18	3/4 6-18
B 3/4 6-3	B 3/4 6-3

SECTION PAGE

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 PRIMARY CONTAINMENT

CONTAINMENT INTEGRITY..... 3/4 6-1

CONTAINMENT LEAKAGE..... 3/4 6-2

CONTAINMENT AIR LOCKS..... 3/4 6-4

INTERNAL PRESSURE..... 3/4 6-6

AIR TEMPERATURE..... 3/4 6-7

CONTAINMENT VESSEL STRUCTURAL INTEGRITY..... 3/4 6-8

CONTAINMENT VENTILATION SYSTEM..... 3/4 6-14

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM..... 3/4 6-15

3/4.6.3 CONTAINMENT ISOLATION VALVES..... 3/4 6-19

3/4.6.4 COMBUSTIBLE GAS CONTROL

HYDROGEN MONITORS..... 3/4 6-36

ELECTRIC HYDROGEN RECOMBINERS..... 3/4 6-37

HYDROGEN PURGE CLEANUP SYSTEM..... 3/4 6-38

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION		PAGE
3/4.7 PLANT SYSTEMS		
3/4.7.1	TURBINE CYCLE	
	SAFETY VALVES	3/4 7-1
	AUXILIARY FEEDWATER SYSTEM	3/4 7-4
	CONDENSATE STORAGE TANK	3/4 7-6
	ACTIVITY	3/4 7-7
	MAIN STEAM LINE ISOLATION VALVES	3/4 7-9
	ATMOSPHERIC DUMP VALVES	3/4 7-10
3/4.7.2	STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION	3/4 7-11
3/4.7.3	ESSENTIAL COOLING WATER SYSTEM	3/4 7-12
3/4.7.4	ESSENTIAL SPRAY POND SYSTEM	3/4 7-13
3/4.7.5	ULTIMATE HEAT SINK	3/4 7-14
3/4.7.6	ESSENTIAL CHILLED WATER SYSTEM	3/4 7-15
3/4.7.7	CONTROL ROOM ESSENTIAL FILTRATION SYSTEM	3/4 7-16
3/4.7.8	ESF PUMP ROOM AIR EXHAUST CLEANUP SYSTEM	3/4 7-19
3/4.7.9	SNUBBERS	3/4 7-21
3/4.7.10	SEALED SOURCE CONTAMINATION	3/4 7-27
3/4.7.11	SHUTDOWN COOLING SYSTEM	3/4 7-29
3/4.7.12	CONTROL ROOM AIR TEMPERATURE	3/4 7-30
3/4.8 ELECTRICAL POWER SYSTEMS		
3/4.8.1	A.C. SOURCES	
	OPERATING	3/4 8-1
	SHUTDOWN	3/4 8-8
	CATHODIC PROTECTION	3/4 8-8a

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3/4.6.1.7 CONTAINMENT VENTILATION SYSTEM

The 42-inch containment purge supply and exhaust isolation valves are required to be closed during plant operation since these valves have not been demonstrated capable of closing during a LOCA or steam line break accident. Maintaining these valves closed during plant operations ensures that excessive quantities of radioactive materials will not be released via the containment purge system. To provide assurance that the 42-inch valves cannot be inadvertently opened, they are sealed closed in accordance with Standard Review Plan 6.2.4 which includes mechanical devices to seal or lock the valve closed, or prevent power from being supplied to the valve operator.

The use of the containment purge lines is restricted to the 8-inch purge supply and exhaust isolation valves since, unlike the 42-inch valves, the 8-inch valves will close during a LOCA or steam line break accident and therefore the site boundary dose guidelines of 10 CFR Part 100 would not be exceeded in the event of an accident during purging operations.

Leakage integrity tests with a maximum allowable leakage rate for purge supply and exhaust isolation valves will provide early indication of resilient material seal degradation and will allow the opportunity for repair before gross leakage failure develops. The 0.60 L_a leakage limit shall not be exceeded when the leakage rates determined by the leakage integrity tests of these valves are added to the previously determined total for all valves and penetrations subject to Type B and C tests.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The containment spray system and the containment cooling system are redundant to each other in providing post-accident cooling of the containment atmosphere. However, the containment spray system also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable spray system to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment automatic isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment and is consistent with the requirements of GDC 54 through GDC 57 of Appendix A to 10 CFR Part 50. Containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

The only valves in Table 6.2.4-1 of the PVNGS FSAR that are not required to be listed in Table 3.6-1 are the following: main steam safety valves, main steam atmospheric dump valves, and main steam isolation valves. The main steam safety valves have very high pressure setpoints to actuate and are covered by Specification 3/4.7.1.1. The atmospheric dump valves and the main steam isolation valves are covered by Specifications 3/4.7.1.6 and 3/4.7.1.5, respectively.

3/4.6.4 COMBUSTIBLE GAS CONTROL

The OPERABILITY of the equipment and systems required for the detection and control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable limit during post-LOCA conditions. Either recombiner unit (or the purge system) is capable of controlling the expected hydrogen generation associated with (1) zirconium-water reactions, (2) radiolytic decomposition of water and (3) corrosion of metals within containment. These hydrogen control systems are consistent with the recommendations of Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA," March 1971.

The use of ANSI Standard N509 (1980) in lieu of ANSI Standard N509 (1976) to meet the guidance of Regulatory Guide 1.52, Revision 2, Positions C.6.a and C.6.b, has been found acceptable as documented in Revision 2 to Section 6.5.1 of the Standard Review Plan (NUREG-0800).

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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 50
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 June 25, 1991, 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 Part 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. 50 , 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 must be fully implemented no later than 45 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R Quay

Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 8, 1992

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 50 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 vertical lines indicating the areas of change.

Remove	Insert
VII	VII
3/4 6-17	3/4 6-17
3/4 6-18	3/4 6-18
B 3/4 6-3	B 3/4 6-3

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION		PAGE
3/4.6 CONTAINMENT SYSTEMS		
3/4.6.1 PRIMARY CONTAINMENT		
	CONTAINMENT INTEGRITY	3/4 6-1
	CONTAINMENT LEAKAGE	3/4 6-2
	CONTAINMENT AIR LOCKS	3/4 6-4
	INTERNAL PRESSURE	3/4 6-6
	AIR TEMPERATURE	3/4 6-7
	CONTAINMENT VESSEL STRUCTURAL INTEGRITY	3/4 6-8
	CONTAINMENT VENTILATION SYSTEM	3/4 6-14
3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS		
	CONTAINMENT SPRAY SYSTEM	3/4 6-15
3/4.6.3 CONTAINMENT ISOLATION VALVES		3/4 6-19
3/4.6.4 COMBUSTIBLE GAS CONTROL		
	HYDROGEN MONITORS	3/4 6-36
	ELECTRIC HYDROGEN RECOMBINERS	3/4 6-37
	HYDROGEN PURGE CLEANUP SYSTEM	3/4 6-38

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION		PAGE
3/4.7 PLANT SYSTEMS		
3/4.7.1 TURBINE CYCLE		
	SAFETY VALVES	3/4 7-1
	AUXILIARY FEEDWATER SYSTEM	3/4 7-4
	CONDENSATE STORAGE TANK	3/4 7-6
	ACTIVITY	3/4 7-7
	MAIN STEAM LINE ISOLATION VALVES	3/4 7-9
	ATMOSPHERIC DUMP VALVES	3/4 7-10
3/4.7.2	STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION	3/4 7-11
3/4.7.3	ESSENTIAL COOLING WATER SYSTEM	3/4 7-12
3/4.7.4	ESSENTIAL SPRAY POND SYSTEM	3/4 7-13
3/4.7.5	ULTIMATE HEAT SINK	3/4 7-14
3/4.7.6	ESSENTIAL CHILLED WATER SYSTEM	3/4 7-15
3/4.7.7	CONTROL ROOM ESSENTIAL FILTRATION SYSTEM	3/4 7-16
3/4.7.8	ESF PUMP ROOM AIR EXHAUST CLEANUP SYSTEM	3/4 7-19
3/4.7.9	SNUBBERS	3/4 7-21
3/4.7.10	SEALED SOURCE CONTAMINATION	3/4 7-27
3/4.7.11	SHUTDOWN COOLING SYSTEM	3/4 7-29
3/4.7.12	CONTROL ROOM AIR TEMPERATURE	3/4 7-30
3/4.8 ELECTRICAL POWER SYSTEMS		
3/4.8.1 A.C. SOURCES		
	OPERATING	3/4 8-1
	SHUTDOWN	3/4 8-8
	CATHODIC PROTECTION	3/4 8-8a

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3/4.6.1.7 CONTAINMENT VENTILATION SYSTEM

The 42-inch containment purge supply and exhaust isolation valves are required to be closed during plant operation since these valves have not been demonstrated capable of closing during a LOCA or steam line break accident. Maintaining these valves closed during plant operations ensures that excessive quantities of radioactive materials will not be released via the containment purge system. To provide assurance that the 42-inch valves cannot be inadvertently opened, they are sealed closed in accordance with Standard Review Plan 6.2.4 which includes mechanical devices to seal or lock the valve closed, or prevent power from being supplied to the valve operator.

The use of the containment purge lines is restricted to the 8-inch purge supply and exhaust isolation valves since, unlike the 42-inch valves, the 8-inch valves will close during a LOCA or steam line break accident and therefore the site boundary dose guidelines of 10 CFR Part 100 would not be exceeded in the event of an accident during purging operations.

Leakage integrity tests with a maximum allowable leakage rate for purge supply and exhaust isolation valves will provide early indication of resilient material seal degradation and will allow the opportunity for repair before gross leakage failure develops. The 0.60 L_a leakage limit shall not be exceeded when the leakage rates determined by the leakage integrity tests of these valves are added to the previously determined total for all valves and penetrations subject to Type B and C tests.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The containment spray system and the containment cooling system are redundant to each other in providing post-accident cooling of the containment atmosphere. However, the containment spray system also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable spray system to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment automatic isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment and is consistent with the requirements of GDC 54 through GDC 57 of Appendix A to 10 CFR Part 50. Containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

The only valves in Table 6.2.4-1 of the PVNGS FSAR that are not required to be listed in Table 3.6-1 are the following: main steam safety valves, main steam atmospheric dump valves, and main steam isolation valves. The main steam safety valves have very high pressure setpoints to actuate and are covered by Specification 3/4.7.1.1. The atmospheric dump valves and the main steam isolation valves are covered by Specifications 3/4.7.1.6 and 3/4.7.1.5, respectively.

3/4.6.4 COMBUSTIBLE GAS CONTROL

The OPERABILITY of the equipment and systems required for the detection and control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable limit during post-LOCA conditions. Either recombiner unit (or the purge system) is capable of controlling the expected hydrogen generation associated with (1) zirconium-water reactions, (2) radiolytic decomposition of water and (3) corrosion of metals within containment. These hydrogen control systems are consistent with the recommendations of Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA," March 1971.

The use of ANSI Standard N509 (1980) in lieu of ANSI Standard N509 (1976) to meet the guidance of Regulatory Guide 1.52, Revision 2, Positions C.6.a and C.6.b, has been found acceptable as documented in Revision 2 to Section 6.5.1 of the Standard Review Plan (NUREG-0800).

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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 37
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 June 25, 1992, 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. 37, 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 must be fully implemented no later than 45 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R. Quay

Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 8, 1992

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 37 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 vertical lines indicating the areas of change.

Remove	Insert
VII	VII
3/4 6-17	3/4 6-17
3/4 6-18	3/4 6-18
B 3/4 6-3	B 3/4 6-3

SECTION PAGE

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 PRIMARY CONTAINMENT

CONTAINMENT INTEGRITY..... 3/4 6-1

CONTAINMENT LEAKAGE..... 3/4 6-2

CONTAINMENT AIR LOCKS..... 3/4 6-4

INTERNAL PRESSURE..... 3/4 6-6

AIR TEMPERATURE..... 3/4 6-7

CONTAINMENT VESSEL STRUCTURAL INTEGRITY..... 3/4 6-8

CONTAINMENT VENTILATION SYSTEM..... 3/4 6-14

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM..... 3/4 6-15

3/4.6.3 CONTAINMENT ISOLATION VALVES..... 3/4 6-19

3/4.6.4 COMBUSTIBLE GAS CONTROL

HYDROGEN MONITORS..... 3/4 6-36

ELECTRIC HYDROGEN RECOMBINERS..... 3/4 6-37

HYDROGEN PURGE CLEANUP SYSTEM..... 3/4 6-38

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION PAGE

3/4.7 PLANT SYSTEMS

3/4.7.1 TURBINE CYCLE

SAFETY VALVES..... 3/4 7-1
AUXILIARY FEEDWATER SYSTEM..... 3/4 7-4
CONDENSATE STORAGE TANK..... 3/4 7-6
ACTIVITY..... 3/4 7-7
MAIN STEAM LINE ISOLATION VALVES..... 3/4 7-9
ATMOSPHERIC DUMP VALVES..... 3/4 7-10

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION..... 3/4 7-11

3/4.7.3 ESSENTIAL COOLING WATER SYSTEM..... 3/4 7-12

3/4.7.4 ESSENTIAL SPRAY POND SYSTEM..... 3/4 7-13

3/4.7.5 ULTIMATE HEAT SINK..... 3/4 7-14

3/4.7.6 ESSENTIAL CHILLED WATER SYSTEM..... 3/4 7-15

3/4.7.7 CONTROL ROOM ESSENTIAL FILTRATION SYSTEM..... 3/4 7-16

3/4.7.8 ESF PUMP ROOM AIR EXHAUST CLEANUP SYSTEM..... 3/4 7-19

3/4.7.9 SNUBBERS..... 3/4 7-21

3/4.7.10 SEALED SOURCE CONTAMINATION..... 3/4 7-27

3/4.7.11 SHUTDOWN COOLING SYSTEM..... 3/4 7-29

3/4.7.12 CONTROL ROOM AIR TEMPERATURE..... 3/4 7-30

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING..... 3/4 8-1
SHUTDOWN..... 3/4 8-8
CATHODIC PROTECTION..... 3/4 8-8a

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3/4.6.1.7 CONTAINMENT VENTILATION SYSTEM

The 42-inch containment purge supply and exhaust isolation valves are required to be closed during plant operation since these valves have not been demonstrated capable of closing during a LOCA or steam line break accident. Maintaining these valves closed during plant operations ensures that excessive quantities of radioactive materials will not be released via the containment purge system. To provide assurance that the 42-inch valves cannot be inadvertently opened, they are sealed closed in accordance with Standard Review Plan 6.2.4 which includes mechanical devices to seal or lock the valve closed, or prevent power from being supplied to the valve operator.

The use of the containment purge lines is restricted to the 8-inch purge supply and exhaust isolation valves since, unlike the 42-inch valves, the 8-inch valves will close during a LOCA or steam line break accident and therefore the site boundary dose guidelines of 10 CFR Part 100 would not be exceeded in the event of an accident during purging operations.

Leakage integrity tests with a maximum allowable leakage rate for purge supply and exhaust isolation valves will provide early indication of resilient material seal degradation and will allow the opportunity for repair before gross leakage failure develops. The 0.60 L_a leakage limit shall not be exceeded when the leakage rates determined by the leakage integrity tests of these valves are added to the previously determined total for all valves and penetrations subject to Type B and C tests.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The containment spray system and the containment cooling system are redundant to each other in providing post-accident cooling of the containment atmosphere. However, the containment spray system also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable spray system to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment automatic isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment and is consistent with the requirements of GDC 54 through GDC 57 of Appendix A to 10 CFR Part 50. Containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

The only valves in Table 6.2.4-1 of the PVNGS FSAR that are not required to be listed in Table 3.6-1 are the following: main steam safety valves, main steam atmospheric dump valves, and main steam isolation valves. The main steam safety valves have very high pressure setpoints to actuate and are covered by Specification 3/4.7.1.1. The atmospheric dump valves and the main steam isolation valves are covered by Specifications 3/4.7.1.6 and 3/4.7.1.5, respectively.

3/4.6.4 COMBUSTIBLE GAS CONTROL

The OPERABILITY of the equipment and systems required for the detection and control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable limit during post-LOCA conditions. Either recombiner unit (or the purge system) is capable of controlling the expected hydrogen generation associated with (1) zirconium-water reactions, (2) radiolytic decomposition of water and (3) corrosion of metals within containment. These hydrogen control systems are consistent with the recommendations of Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA," March 1971.

The use of ANSI Standard N509 (1980) in lieu of ANSI Standard N509 (1976) to meet the guidance of Regulatory Guide 1.52, Revision 2, Positions C.6.a and C.6.b, has been found acceptable as documented in Revision 2 to Section 6.5.1 of the Standard Review Plan (NUREG-0800).

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 64 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 50 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 37 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNIT NOS. 1, 2, AND 3

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

1.0 INTRODUCTION

By letter dated June 25, 1991, the Arizona Public Service Company (APS or the licensee) submitted a request for changes to the Technical Specifications (TS) for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (Appendix A to Facility Operating License Nos. NPF-41, NPF-51, and NPF-74, respectively). The 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 eliminate the hydrazine additive in the containment spray system at the Palo Verde Nuclear Generating Station Units 1, 2, and 3, by deleting Section 3/4.6.2.2 "Iodine Removal System" from the Technical Specifications (TS).

The existing TS for the Palo Verde nuclear units requires use of the containment spray system in conjunction with the iodine removal system for removal of iodine from a post-accident containment atmosphere. The iodine removal system adds hydrazine to the containment spray solution. The licensee has pointed out in the submittal that the revised Standard Review Plan (SRP) Section 6.5.2, "Containment Spray as a Fission Product Cleanup System," issued in December 1988, no longer requires chemical additive injection into the containment spray solution so long as the containment sump solution pH is maintained basic. The licensee also stated in the submittal that at Palo Verde, the containment sump solution pH will be maintained above 7.0 using trisodium phosphate which is contained in baskets located on the containment floor.

The licensee has, therefore, proposed elimination of the hydrazine addition to the containment spray solution and has requested deletion of TS Section 3/4.6.2.2 from the Technical Specifications for the Palo Verde nuclear units and has provided justification for its removal. In its technical justification, the licensee recalculated the offsite and control room operator

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doses in accordance with the revised SRP Section 6.5.2 to show its compliance with the acceptable criteria stated in the section. The licensee stated in the submittal that the removal of the hydrazine additive will reduce equipment maintenance and surveillance efforts, and it will also reduce the potential hazards (caustic effect) to personnel and property from leaking seals, pumps, and valves.

2.0 EVALUATION

2.1 Radiological Issues

The as-built and operational Palo Verde containment spray system consists of two independent 100%-capacity loops each containing a containment spray pump, a shutdown cooling heat exchanger, a spray header, and associated valves, piping, and instrumentation. Each of the two containment spray pumps is rated at 3650 gpm. Containment spray is automatically initiated by a containment spray actuation signal (CSAS), which occurs on high-high containment pressure. Upon receipt of a CSAS the containment spray pumps are started, the spray header isolation valves are opened and spray water from the Refueling Water Tank is delivered to the containment spray headers. Positive displacement pumps will also automatically start and add hydrazine from the hydrazine tank to the containment spray lines. When the water level in the RWT reaches a specified low setpoint, a recirculation actuation signal (RAS) will automatically align the containment spray pump suctions to the containment sumps by opening the containment sump isolation valves.

The staff evaluated iodine removal effectiveness of the containment spray system with the hydrazine addition in accordance with Revision 1 (July 1981) of the SRP Section 6.5.2 and has accepted the design in Supplement No. 5 to the Palo Verde Safety Evaluation Report (NUREG-0857) dated November 1983. Subsequently, the staff issued a revision of the SRP Section 6.5.2 in December 1988. The revision acknowledged that a chemical additive is not necessarily required during spray injection so long as pH control is maintained for the sump water during post-accident conditions. The revision also provided a revised methodology for calculation of iodine removal efficiencies for the containment spray system.

Using the revised methodology, the licensee calculated the offsite and control room operator doses following a postulated LOCA. This calculation demonstrated that the requested removal of the chemical additive to the containment spray lines will not result in a significant increase in the offsite and control room operator doses and that these doses still meet the guidelines set forth in 10 CFR 100 and GDC-19.

The staff has verified the licensee's dose calculation by performing an independent radiological consequence analysis using the new iodine removal coefficients calculated in accordance with the methodology provided in the revised SRP Section 6.5.2 and using the same assumptions previously used for LOCA dose calculation in Supplement No. 5 (Table 15-1) of the Palo Verde SER. The revised iodine removal coefficients and associated radiological

consequences of a LOCA are listed in Tables 1 and 2. As shown in the Table 2, the staff finds that the offsite and control room operator doses are still within the dose guidelines set forth in 10 CFR 100 and GDC-19, thus verifying the licensee's calculation.

The staff concludes that, with respect to radiological issues, the proposed changes to the Palo Verde TS concerning elimination of the hydrazine additive to the containment spray lines are acceptable. This conclusion is based on (1) the staff review of the licensee's analysis and (2) the independent analysis by the staff which confirms that the distances to the exclusion area boundary and to the low population zone of the Palo Verde site are still sufficient to provide reasonable assurance that the radiological consequences of a LOCA will be within the dose guidelines set forth in 10 CFR 100 and that control room operator doses following a LOCA will be within the dose guidelines set forth in GDC-19. Therefore, the staff finds the conclusions stated in Supplement No. 5 of the Palo Verde SER Section 6.4, "Control Room Habitability," and Section 15.4, "Radiological Consequences of Design Basis Accidents" are not affected and still remain the same.

2.2 Materials and Chemistry Issues

During the injection phase, the licensee proposes to operate the containment sprays with borated water without the hydrazine additive. The pH of this water could be well below 7. Using the information currently available on iodine removal and the guidance provided in Section 6.5.2 of the Standard Review Plan, the licensee has demonstrated that, even at a relatively low pH, elemental iodine could be efficiently removed from the post accident containment atmosphere without the presence of hydrazine, provided the spray solution was free from previously dissolved iodine. This occurs because the rates of removal of elemental iodine are determined by the first-order removal coefficients which are independent of pH and chemical nature of the spray solution. The same applies to the removal coefficients for particulates iodine which is controlled only by hydrodynamical characteristics of the sprays. The licensee calculated these coefficients using the methods given in Section 6.5.2 of the Standard Review Plan and found them to be conservative relative to the coefficients determined in the original evaluation which was approved by the staff. Similar conservatism existed in the evaluation of decontamination factors.

During the recirculation phase, spray water will come from the sump and will contain dissolved iodine, removed from the containment atmosphere during the injection phase. In radiation environment this iodine could be revolatilized and released back to the containment if pH of the solution is too low. In order to prevent it from happening, the pH of the sump solution should be kept above 7. Currently, the licensee has a provision for maintaining pH higher than 7 by means of trisodium phosphate kept in the basket located in the sump. During an accident this chemical will dissolve in the sump water and will buffer its pH at the above 7 value. Because hydrazine is a very weak base, its removal from the sprays will not change this pH control mechanism.

There is also another reason for maintaining solution in the sump alkaline. Higher pH minimizes corrosion of metallic surfaces. Chloride induced stress corrosion cracking of austenitic stainless steel components is considerably reduced if pH of the solution is maintained above 7. Short exposure to low pH water during the injection phase will not cause significant stress corrosion cracking, but more extended exposure during the recirculation phase may result in a significant damage. Section 6.1.1. of the Standard Review Plan (Branch Technical Position MTEB 6-1) recommends pH in the 7 to 9.5 range. The current plant design ensures that alkaline pH is maintained in the sump and removal of hydrazine additive would not significantly affect this condition.

Control of sump pH is also required to minimize hydrogen generation by corrosion of aluminum and zinc on galvanized surfaces and in organic coatings on the containment surfaces. The licensee has shown that the proposed deletion of hydrazine from the spray solution will not affect its chemical nature sufficiently to make it more a corrosive medium for aluminum and zinc. Previously approved analyses for hydrogen generation remains, therefore, applicable.

For the same reason deletion of hydrazine will not significantly change the effect spray solution has on the equipment located in the containment and the previously approved environmental qualification will remain valid. Finally, the proposed elimination of hydrazine will not compromise the containment spray system's operational capability.

We have reviewed the licensee's analyses and performed our independent verifications and concur with the licensee's justifications for elimination of the hydrazine additive. Based on the above evaluation, the staff concludes that, with respect to materials and chemistry issues, the proposed modification to Palo Verde Nuclear Generating Station's containment spray system is acceptable.

3.0 STATE CONSULTATION

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

4.0 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 and changes surveillance requirements. 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 (56 FR 43803). 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.

5.0 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: J. Lee
K. Parczewski
T. Chandra

Date: September 8, 1992

TABLE 1

Containment Spray Iodine Removal Efficiencies (hour -1)

	Current (1)	New
Elemental iodine	21	20
Organic iodine	0	0
Particulate iodine	0.41	0.34
Decontamination Factor	200	6.51

(1) Table 15-1 of Supplement No. 5 to Palo Verde SER (NUREG-0857)

TABLE 2

Radiological Consequences (rem)

	EAB (2)		LPZ (3)		Control Room	
	Thyroid	Whole Body	Thyroid	Whole Body	Thyroid	Whole Body
Containment Leakage	94	2.5	83	1.1	9.5	<1
ESF Leakage	14	<0.1	43	<0.1	<0.5	<1
Total	108	<2.6	126	<1.2	<10.0	<1

(2) Exclusion Area Boundary

(3) Low Population Zone Outer Boundary

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

September 8, 1992

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

Dear Mr. Conway:

SUBJECT: ISSUANCE OF AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION UNIT NO. 1 (TAC NO. M80905), UNIT NO. 2 (TAC NO. M80906), AND UNIT NO. 3 (TAC NO. M80907)

The Commission has issued the enclosed Amendment No. 64 to Facility Operating License No. NPF-41, Amendment No. 50 to Facility Operating License No. NPF-51, and Amendment No. 37 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 June 25, 1991.

These amendments delete the Iodine Removal System from Technical Specifications 3/4 3.6.2.2 for Units 1, 2, and 3. The Iodine Removal System uses hydrazine as an additive to the containment spray system at Palo Verde. The removal of the hydrazine additive from the containment spray system will not result in a significant increase in post-Loss of Coolant Accident (LOCA) doses outside of containment.

A copy of the related Safety Evaluation is also enclosed. A notice of issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Original signed by:

Catherine M. Thompson, Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 64 to NPF-41
2. Amendment No. 50 to NPF-51
3. Amendment No. 37 to NPF-74
4. Safety Evaluation

cc w/enclosures:
See next page

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