

October 23, 1996

Mr. James M. Levine
Executive Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, Arizona 85072-3999

SUBJECT: ISSUANCE OF AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION
UNIT NO. 1 (TAC NO. M95880), UNIT NO. 2 (TAC NO. M95881), AND UNIT
NO. 3 (TAC NO. M95882)

Dear Mr. Levine:

The Commission has issued the enclosed Amendment No. 109 to Facility Operating License No. NPF-41, Amendment No. 101 to Facility Operating License No. NPF-51, and Amendment No. 81 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 17, 1996.

These amendments modify the Technical Specifications (TS) to change (1) the reference method for calculating dose conversion factors (DCFs) to be used in dose calculations, and (2) the upper and lower limits for operating pressurizer pressure to account for new instrument uncertainties and to reduce the allowed operating band.

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

Sincerely,

Original Signed By
James W. Clifford, Senior 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. 109 to NPF-41
 2. Amendment No. 101 to NPF-51
 3. Amendment No. 81 to NPF-74
 4. Safety Evaluation

cc w/encls: See next page

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DOCUMENT NAME: PV95880.AMD

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| OFC | PDIV-2/PM | PDIV-2/LA | OGC <i>NLS</i> |
| NAME | JClifford | <i>edp</i> EPeyton | <i>Marian</i> |
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DOCUMENT NAME: PV95880.AMD

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| OFC | PDIV-2/PM | PDIV-2/LA | OGC NLS |
| NAME | JClifford | EPeyton | N. ... |
| DATE | 10/23/96 | 10/17/96 | 10/22/96 |

OFFICIAL RECORD COPY



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 23, 1996

Mr. James M. Levine
Executive Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, Arizona 85072-3999

SUBJECT: ISSUANCE OF AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION
UNIT NO. 1 (TAC NO. M95880), UNIT NO. 2 (TAC NO. M95881), AND UNIT
NO. 3 (TAC NO. M95882)

Dear Mr. Levine:

The Commission has issued the enclosed Amendment No. 109 to Facility Operating License No. NPF-41, Amendment No. 101 to Facility Operating License No. NPF-51, and Amendment No. 81 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 17, 1996.

These amendments modify the Technical Specifications (TS) to change (1) the reference method for calculating dose conversion factors (DCF) to be used in dose calculations, and (2) the upper and lower limits for operating pressurizer pressure to account for new instrument uncertainties and to reduce the allowed operating band.

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James W. Clifford, Senior 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
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Enclosures: 1. Amendment No. 109 to NPF-41
2. Amendment No. 101 to NPF-51
3. Amendment No. 81 to NPF-74
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cc w/encls: See next page

Mr. James M. Levine

- 2 -

October 23, 1996

cc w/encl:

Mr. Steve Olea
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Chairman, Board of Supervisors
ATTN: Chairman
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Nuclear Licensing
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Phoenix, Arizona 85072-2034

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Phoenix, Arizona 85004



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. 109
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 17, 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. 109, 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 its date of issuance to be implemented within 45 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: October 23, 1996

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 109 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

1-3
3/4 2-10
B 3/4 2-4

INSERT

1-3
3/4 2-10
B 3/4 2-4

DEFINITIONS

CORE OPERATING LIMITS REPORT

1.9a The CORE OPERATING LIMITS REPORT is the unit-specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Technical Specification 6.9.1. Plant operation within these operating limits is addressed in individual specifications.

DOSE EQUIVALENT I-131

1.10 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ICRP-30, Supplement to Part 1, page 192-212, Table titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity."

\bar{E} - AVERAGE DISINTEGRATION ENERGY

1.11 \bar{E} shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half-lives greater than 15 minutes, making up at least 95% of the total noniodine activity in the coolant.

ENGINEERED SAFETY FEATURES RESPONSE TIME

1.12 The ENGINEERED SAFETY FEATURES RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

FREQUENCY NOTATION

1.13 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.1.

GASEOUS RADWASTE SYSTEM

1.14 A GASEOUS RADWASTE SYSTEM shall be any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system offgases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

1.15 IDENTIFIED LEAKAGE shall be:

- a. Leakage into closed systems, other than reactor coolant pump controlled bleed-off flow, such as pump seal or valve packing leaks that are captured and conducted to a sump or collecting tank, or
- b. Leakage into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be PRESSURE BOUNDARY LEAKAGE, or
- c. Reactor Coolant System leakage through a steam generator to the secondary system.

DEFINITIONS

K_{N-1}

1.16 K_{N-1} is the k effective calculated by considering the actual CEA configuration and assuming that the fully or partially inserted full-length CEA of the highest worth is fully withdrawn.

MEMBER(S) OF THE PUBLIC

1.17 MEMBER(S) OF THE PUBLIC shall include all persons who are not occupationally associated with the plant. This category does not include employees of the licensee, its contractors, or vendors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational, or other purposes not associated with the plant.

OFFSITE DOSE CALCULATION MANUAL (ODCM)

1.18 The OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Section 6.8.4, and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Annual Radioactive Effluent Release Reports required by Specifications 6.9.1.7 and 6.9.1.8.

OPERABLE - OPERABILITY

1.19 A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

OPERATIONAL MODE - MODE

1.20 An OPERATIONAL MODE (i.e. MODE) shall correspond to any one inclusive combination of core reactivity condition, power level, and cold leg reactor coolant temperature specified in Table 1.2.

POWER DISTRIBUTION LIMITS

3/4.2.7 AXIAL SHAPE INDEX

LIMITING CONDITION FOR OPERATION

3.2.7 The core average AXIAL SHAPE INDEX (ASI) shall be maintained within the limits specified in the CORE OPERATING LIMITS REPORT:

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER*.

ACTION:

With the core average AXIAL SHAPE INDEX outside the limits specified in the CORE OPERATING LIMITS REPORT, restore the core average ASI to within its limit within 2 hours or reduce THERMAL POWER to less than 20% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.7 The core average AXIAL SHAPE INDEX shall be determined to be within its limit at least once per 12 hours using the COLSS or any OPERABLE Core Protection Calculator channel.

* See Special Test Exception 3.10.2.

POWER DISTRIBUTION LIMITS

3/4.2.8 PRESSURIZER PRESSURE

LIMITING CONDITION FOR OPERATION

3.2.8 The pressurizer pressure shall be maintained between 2130 psia and 2295 psia.

APPLICABILITY: MODES 1 and 2.

ACTION:

With the pressurizer pressure outside its above limits, restore the pressure to within its limit within 2 hours or be in at least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.8 The pressurizer pressure shall be determined to be within its limit at least once per 12 hours.

POWER DISTRIBUTION LIMITS

BASES

3/4.2.5 RCS FLOW RATE

This specification is provided to ensure that the actual RCS total flow rate is maintained at or above the minimum value used in the safety analyses. The minimum value used in the safety analyses is 95% of the design flow rate (164.0×10^6 lbm/hr) or 155.8×10^6 lbm/hr. The actual RCS flow rate is determined by direct measurement and an uncertainty associated with that measurement is considered when comparing actual RCS flow rate to the minimum required value of 155.8×10^6 lbm/hr.

3/4.2.6 REACTOR COOLANT COLD LEG TEMPERATURE

This specification is provided to ensure that the actual value of reactor coolant cold leg temperature is maintained within the range of values used in the safety analyses.

3/4.2.7 AXIAL SHAPE INDEX

This specification is provided to ensure that the actual value of the core average AXIAL SHAPE INDEX is maintained within the range of values used in the safety analyses.

3/4.2.8 PRESSURIZER PRESSURE

This specification is provided to ensure that the actual value of pressurizer pressure is maintained within the range of values used in the safety analyses. The values for the pressurizer pressure LCO are indicated values and include consideration of instrument uncertainties.



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. 101
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 17, 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. 101, 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 its date of issuance to be implemented within 45 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: October 23, 1996

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 101 TO FACILITY OPERATING LICENSE NO. NPF-51

DOCKET NO. STN 50-529

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K_{N-1}

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OPERATIONAL MODE - MODE

1.20 An OPERATIONAL MODE (i.e. MODE) shall correspond to any one inclusive combination of core reactivity condition, power level, and cold leg reactor coolant temperature specified in Table 1.2.

POWER DISTRIBUTION LIMITS

3/4.2.7 AXIAL SHAPE INDEX

LIMITING CONDITION FOR OPERATION

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APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER*.

ACTION:

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SURVEILLANCE REQUIREMENTS

4.2.7 The core average AXIAL SHAPE INDEX shall be determined to be within its limit at least once per 12 hours using the COLSS or any OPERABLE Core Protection Calculator channel.

* See Special Test Exception 3.10.2.

POWER DISTRIBUTION LIMITS

3/4.2.8 PRESSURIZER PRESSURE

LIMITING CONDITION FOR OPERATION

3.2.8 The pressurizer pressure shall be maintained between 2130 psia and 2295 psia.

APPLICABILITY: MODES 1 and 2*.

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SURVEILLANCE REQUIREMENTS

4.2.8 The pressurizer pressure shall be determined to be within its limit at least once per 12 hours.

*See Special Test Exception 3.10.5

POWER DISTRIBUTION LIMITS

BASES

3/4.2.5 RCS FLOW RATE

This specification is provided to ensure that the actual RCS total flow rate is maintained at or above the minimum value used in the safety analyses. The minimum value used in the safety analyses is 95% of the design flow rate (164.0×10^6 lbm/hr) or 155.8×10^6 lbm/hr. The actual RCS flow rate is determined by direct measurement and an uncertainty associated with that measurement is considered when comparing actual RCS flow rate to the minimum required value of 155.8×10^6 lbm/hr.

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3/4.2.7 AXIAL SHAPE INDEX

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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. 81
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 17, 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. 81, 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 its date of issuance to be implemented within 45 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: October 23, 1996

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 81 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

1-3
3/4 2-10
B 3/4 2-4

INSERT

1-3
3/4 2-10
B 3/4 2-4

DEFINITIONS

CORE OPERATING LIMITS REPORT

1.9a The CORE OPERATING LIMITS REPORT is the unit-specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Technical Specification 6.9.1. Plant operation within these operating limits is addressed in individual specifications.

DOSE EQUIVALENT I-131

1.10 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ICRP-30, Supplement to Part 1, page 192-212, Table titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity."

\bar{E} - AVERAGE DISINTEGRATION ENERGY

1.11 \bar{E} shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half-lives greater than 15 minutes, making up at least 95% of the total noniodine activity in the coolant.

ENGINEERED SAFETY FEATURES RESPONSE TIME

1.12 The ENGINEERED SAFETY FEATURES RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

FREQUENCY NOTATION

1.13 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.1.

GASEOUS RADWASTE SYSTEM

1.14 A GASEOUS RADWASTE SYSTEM shall be any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system offgases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

IDENTIFIED LEAKAGE

1.15 IDENTIFIED LEAKAGE shall be:

- a. Leakage into closed systems, other than reactor coolant pump controlled bleed-off flow, such as pump seal or valve packing leaks that are captured and conducted to a sump or collecting tank, or
- b. Leakage into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be PRESSURE BOUNDARY LEAKAGE, or
- c. Reactor Coolant System leakage through a steam generator to the secondary system.

DEFINITIONS

K_{N-1}

1.16 K_{N-1} is the k effective calculated by considering the actual CEA configuration and assuming that the fully or partially inserted full-length CEA of the highest inserted worth is fully withdrawn.

MEMBER(S) OF THE PUBLIC

1.17 MEMBER(S) OF THE PUBLIC shall include all persons who are not occupationally associated with the plant. This category does not include employees of the licensee, its contractors, or vendors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational, or other purposes not associated with the plant.

OFFSITE DOSE CALCULATION MANUAL (ODCM)

1.18 The OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Section 6.8.4, and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Annual Radioactive Effluent Release Reports required by Specifications 6.9.1.7 and 6.9.1.8.

OPERABLE - OPERABILITY

1.19 A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

OPERATIONAL MODE - MODE

1.20 An OPERATIONAL MODE (i.e. MODE) shall correspond to any one inclusive combination of core reactivity condition, power level, and cold leg reactor coolant temperature specified in Table 1.2.

POWER DISTRIBUTION LIMITS

3/4.2.7 AXIAL SHAPE INDEX

LIMITING CONDITION FOR OPERATION

3.2.7 The core average AXIAL SHAPE INDEX (ASI) shall be maintained within the limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER*.

ACTION:

With the core average AXIAL SHAPE INDEX outside the limits specified in the CORE OPERATING LIMITS REPORT, restore the core average ASI to within its limit within 2 hours or reduce THERMAL POWER to less than 20% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.7 The core average AXIAL SHAPE INDEX shall be determined to be within its limit at least once per 12 hours using the COLSS or any OPERABLE Core Protection Calculator channel.

* See Special Test Exception 3.10.2.

POWER DISTRIBUTION LIMITS

3/4.2.8 PRESSURIZER PRESSURE

LIMITING CONDITION FOR OPERATION

3.2.8 The pressurizer pressure shall be maintained between 2130 psia and 2295 psia.

APPLICABILITY: MODES 1 and 2.

ACTION:

With the pressurizer pressure outside its above limits, restore the pressure to within its limit within 2 hours or be in at least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.8 The pressurizer pressure shall be determined to be within its limit at least once per 12 hours.

POWER DISTRIBUTION LIMITS

BASES

3/4.2.5 RCS FLOW RATE

This specification is provided to ensure that the actual RCS total flow rate is maintained at or above the minimum value used in the safety analyses.

The minimum value used in the safety analysis is 95% of the design flow rate (164.0×10^6 lbm/hr) or 155.8×10^6 lbm/hr. The actual RCS flow rate is determined by direct measurement and an uncertainty associated with that measurement is considered when comparing actual RCS flow rate to the minimum required value of 155.8×10^6 lbm/hr.

3/4.2.6 REACTOR COOLANT COLD LEG TEMPERATURE

This specification is provided to ensure that the actual value of reactor coolant cold leg temperature is maintained within the range of values used in the safety analyses.

3/4.2.7 AXIAL SHAPE INDEX

This specification is provided to ensure that the actual value of the core average AXIAL SHAPE INDEX is maintained within the range of values used in the safety analyses.

3/4.2.8 PRESSURIZER PRESSURE

This specification is provided to ensure that the actual value of pressurizer pressure is maintained within the range of values used in the safety analyses. The values for the pressurizer pressure LCO are indicated values and include consideration of instrument uncertainties.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 109 TO FACILITY OPERATING LICENSE NO. NPF-41,
AMENDMENT NO. 101 TO FACILITY OPERATING LICENSE NO. NPF-51,
AND AMENDMENT NO. 81 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 June 17, 1996, the Arizona Public Service Company (APS or the licensee) requested changes to the Technical Specifications (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 modify the technical specifications (TS) to change (1) the reference method for calculating dose conversion factors (DCFs) to be used in dose calculations, and (2) the upper and lower limits for operating pressurizer pressure to account for new instrument uncertainties and to reduce the allowed operating band.

2.0 EVALUATION

Dose Conversion Factors

Calculation of dose equivalent iodine-131 is used for evaluating the allowable radionuclide concentrations in the reactor coolant and assessing thyroid doses from releases of radioactivity resulting from design basis accidents (DBAs). Dose equivalent iodine-131 is defined as that concentration of iodine-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of iodine-131, iodine-132, iodine-133, iodine-134, and iodine-135 actually present.

A required parameter for translating radioiodine concentration to a radiological dose to the thyroid is the thyroid DCF. Revision 1 of NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants," specifies thyroid dose conversion factors that can be used for calculating dose equivalent iodine-131 at Combustion Engineering plants. The three references for thyroid dose conversion factors are: (1) TID-14844, which was published in 1962; (2) Table E-7 of Revision 1 to Regulatory Guide 1.109, "Calculations of Annual Doses to Man from Routine Releases of Reactor

Effluent for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," which was published in 1977; and (3) ICRP-30, which was published in 1980. Table 1 lists the thyroid DCFs contained in the aforementioned documents. In a safety analysis contained in its application, the licensee concluded that the requested change to ICRP-30 thyroid DCFs would reduce calculated thyroid dose consequences of design basis accidents by approximately 30 percent, which, in turn, would increase design margin and fuel management flexibility when performing cycle-specific reload analysis. The licensee stated in its application that the net effect of using the additional design margin will be radiological consequences to the thyroid that are less than or equal to current licensing basis dose consequences. Radiological consequences to the whole body were not addressed by the licensee, and are beyond the scope of its application.

The staff has reviewed the licensee's request and performed independent check calculations to determine the radiological consequences to the thyroid of the requested change to TS 1.10 and associated Bases. The staff calculated thyroid doses using thyroid DCFs contained in TID-14844 and ICRP-30 for a design basis large break loss-of-coolant accident (LOCA) and a steam generator tube rupture (SGTR) accident. The results of the staff's analysis indicate that for the LOCA and SGTR accidents, replacement of TID-14844 thyroid DCFs with ICRP-30 thyroid DCFs would reduce calculated thyroid doses by greater than 20 percent for individuals located at the exclusion area boundary, low-population zone, and control room. Similar reductions in postulated thyroid doses are expected for other design basis accidents by replacing TID-14844 thyroid DCFs with ICRP-30 thyroid DCFs. Use of ICRP-30 DCFs is consistent with NUREG-1432 as well as the revisions to 10 CFR Part 20, which utilizes ICRP-30 recommendations and data. The staff therefore concludes that the proposed change is acceptable.

Change in Pressurizer Pressure Operating Limits

The safety analyses for normal operating conditions and anticipated operational occurrences assume initial conditions within the allowed steady state envelope. The limiting condition for operation (LCO) provided in TS 3.2.8 for minimum and maximum RCS pressures, as measured at the pressurizer, ensure that the actual value of pressurizer pressure is maintained during normal operation within the range of values used in the safety analysis, thereby providing assurance that the minimum departure from nucleate boiling ratio (DNBR) will meet the required criteria for each of the transients analyzed.

Table 2 provides a comparison of the old and proposed values of the upper and lower pressurizer pressure limits for the Safety Analysis and the TS LCO. The proposed TS 3.2.8 LCO accounts for new instrument uncertainties, and reduces the allowed operating band. These more restrictive initial conditions are used in bounding safety analyses for some events previously analyzed on cycle-specific bases, which will provide more flexibility in fuel management in future cycles. The reduction of the upper limit from 2,300 psia to 2,295 psia accommodates an increase in pressure transmitter instrument uncertainty. The increase in the lower limit from 2,025 psia to 2,130 psia accommodates the new

instrument uncertainty, and provides the increased flexibility in fuel management in future cycles.

The current pressurizer pressure upper and lower safety analysis analytical limits are 2,325 psia and 2,000 psia, respectively. These were the analytical limits from which the current TS 3.2.8 LCO values were derived, with a 25 psia uncertainty. Surveillance procedures that verify compliance with TS 3.2.8 previously used 2,025 to 2,300 psia as the acceptance range which included the total loop uncertainty, including the pressure indicator. The new safety analysis analytical values for the upper and lower limits will be 2,325 and 2,100 psia, respectively.

Pressure transmitter uncertainty has increased due to a change to the transmitter temperature effect specification communicated to ITT Barton users in an Industry Advisor letter dated September 14, 1995. The original pressure uncertainty specification due to transmitter temperature variation was ± 1 percent of full span per 100°F. The new specification includes an additional 3 psi of uncertainty per 100°F. When the additional transmitter bias of 3 psi is accounted for, the loop uncertainty results are +28.2/-28.1 psi, which is greater than the allowed ± 25 psi value. The new loop uncertainty value was obtained by rounding up to a more conservative value of ± 30 psi uncertainty. Using the new ± 30 psi uncertainty value, the new TS LCO upper and lower values for pressurizer pressure are modified to 2,295 psia and 2,130 psia, respectively.

TS 3.2.8 establishes the range of the initial conditions for pressurizer pressure considered for transients analyzed in the safety analyses. The licensee stated that the proposed change associated with the pressurizer pressure will implement a more restrictive acceptance criteria in surveillance procedures to ensure that safety analysis assumptions are maintained. The licensee further stated that the more restrictive range of operation is currently analyzed and bounded by the existing safety analyses. The staff reviewed the licensee's submittal, and agrees with the licensee's conclusion that the more restrictive range of operation is bounded by the existing safety analyses, and is therefore acceptable.

3.0 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.

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. 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 (61 FR 47963). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Attachments: 1. Table 1
 2. Table 2

Principal Contributors: A. Huffert
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Date: October 23, 1996

TABLE 1

THYROID DOSE CONVERSION FACTORS REFERENCED IN
COMBUSTION ENGINEERING STANDARD TECHNICAL SPECIFICATIONS

| <u>IODINE ISOTOPE</u> | <u>TID-14844 (Rem/Ci)</u> | <u>RG 1.109 (Rem/Ci)</u> | <u>ICRP-30 (Rem/Ci)</u> |
|---------------------------|-------------------------------|------------------------------|-----------------------------|
| I-131 | 1.48×10^6 | 1.49×10^6 | 1.08×10^6 |
| I-132 | 5.35×10^4 | 1.43×10^4 | 6.44×10^3 |
| I-133 | 4.00×10^5 | 2.69×10^5 | 1.80×10^5 |
| I-134 | 2.50×10^4 | 3.73×10^3 | 1.07×10^3 |
| I-135 | 1.24×10^5 | 5.60×10^4 | 3.13×10^4 |

TABLE 2

COMPARISON OF PRESSURIZER PRESSURE LIMITS

| | Safety Analysis | | Tech Spec LCO | |
|--------------------|-----------------|------------|---------------|------------|
| | <u>Old</u> | <u>New</u> | <u>Old</u> | <u>New</u> |
| Upper Limit (psia) | 2,325 | 2,325 | 2,300 | 2,295 |
| Lower Limit (psia) | 2,000 | 2,100 | 2,025 | 2,130 |