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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 44 TO FACILITY OPERATING LICENSE NO. NPF-41,

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNIT 1

DOCKET NO. STN 50-528

1.0 INTRODUCTION

By letter dated January 12, 1988 (Ref. 1) the Arizona Public Service Company (APS) 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 (licensees), requested changes to the Technical Specifications for the Palo Verde Nuclear Generating Station, Units 1, (Appendix A to Facility Operating License No. NPF-41. In support of both the Technical Specification changes and Cycle 3 operation, the licensees submitted a Reload Analysis Report by letter dated January 18, 1989 (Ref. 2). By letters dated April 19 and 26, June 27, August 25, and September 11, 1989 (Refs. 3, 4, 5, 27 and 28), the licensees also provided clarifying information on the Reload Analysis Report. The staff's evaluation of the reload analysis is presented in Section 2.0 through 5.0 below. The evaluation of the specific change to the Technical Specification is presented in Section 3.0 below.

2.0 EVALUATION OF FUEL DESIGN

2.1 Mechanical Design

No changes in the fuel mechanical design basis have occurred in the fabrication of the Batch E fuel. A modification to the poison rod assembly design was incorporated into the Batch E fuel to improve the burnup capability of the poison rods. The poison rod assembly's overall length was increased to be of equal length with the fuel rods. The increased length provides greater internal void volume which enables higher burnups with poison rods with higher B-10 loadings, while reducing end-of-life internal pressure.

The staff has found Reference 4 acceptable where clad collapse analyses are not necessary for new Combustion Engineering manufactured fuel because of the absence of gaps between pellets.

We find the above change to be a minor improvement which does not affect the mechanical design basis and, thus is acceptable.

2.2 Thermal Design

The Cycle 3 thermal performance evaluation was based on the performance of a composite fuel pin of fuel batches B, C, D, and E. The evaluation was performed using the NRC approved code FATES3A (Refs. 5 through 8) and a power history enveloping the power and burnup levels representative of the peak pin at each burnup interval from the beginning of cycle to the end of burnup (Ref. 5). The peak pin burnup analyzed is in excess of that expected at the end of Cycle 3. Based on this analysis, the internal pressure in the most limiting fuel rod will be 1,149.8 psia which is far below the reactor coolant pressure of 2,250 psia. This satisfies the SRP requirements and is acceptable.

2.3 Nuclear Design

2.3.1 Fuel Management

The Cycle 3 core will consist of 1 Batch B assembly, 52 Batch C, 80 Batch D, and 108 Batch E (new) assemblies. The Cycle 3 loading is low leakage, using previously burned assemblies in the periphery. Thus, most of the Batch E assemblies are located throughout the core interior. The expected Cycle 3 lifetime is 475 effective full power days. The highest Batch E enrichment is 4.03 w/o U-235 which is lower than the 4.05 w/o U-235 for which the Palo Verde facilities have been approved for fuel storage. Comparison of characteristic physics parameters for Cycle 3 and Cycle 2 (the reference cycle) shows that the two cycles vary little from each other, and therefore Cycle 3, is acceptable.

2.3.2 Power Distribution

Calculated all-rods-out relative assembly power densities were provided for the beginning, middle and the end of cycle. Relative assembly power densities for rodded configurations were also presented. The rodded configurations are those allowed by the power dependent insertion limit at full power. The nominal axial peaking factors are estimated to range from 1.23 to 1.12 at the beginning and end of Cycle 3, respectively. Augmentation factors have been eliminated from this cycle as discussed in Reference 9. The methodology for the physics and power distribution calculations is based on ROCS-DIT (with the MC module) which has been approved by the NRC (Refs. 10,11). These calculations, which are based on approved methods, are acceptable.

2.3.3 Control Requirements

The most restrictive value of the shutdown margin occurs at the end of cycle under hot zero power conditions. The minimum shutdown margin required to control the reactivity transient resulting from a steam line break is 6.5% dealt-k/k. This shutdown margin is assured as discussed in

paragraph 2.5.3. In addition sufficient boration capability and control element assembly worth with a stuck control element assembly exist to meet these shutdown requirements.

These results were derived with approved methods and incorporated conservative assumptions, therefore, the results are acceptable.

2.4 Thermal-Hydraulic Design

Steady state thermal-hydraulic analyses for Cycle 3 were performed using the approved code TORC (Ref. 11), the Combustion Engineering CE-1 critical heat flux correlation (Ref. 12) and the CETOP code described in Reference 13. The methodologies described in References 10-12 with the statistical combination of uncertainties (Ref. 14) the core protection system, the core operating limit system and the DNBR value of 1.24 assures that at the 95/95 confidence/probability level that the hot rod will not experience DNB. The 1.24 value includes all applicable penalties, such as the rod bow for burnups to 30,000 MWD/MTU, the .01 DNBR for the HID-1 grids and the penalties specified in the statistical combination of uncertainties (Ref. 15-17). The rod bow value used in the analysis is 1.7% DNBR, for burnups up to 30,000 MWD/MTU. For burnups higher than 30,000 MWD/MTU sufficient margin exists to offset the rod bow penalty due to lower radial power peaks in these higher burnup assemblies and rods, hence, the rod bow penalty is adequate for all anticipated burnups.

We conclude that the thermal-hydraulic design analyses were performed using approved codes and accounted for all applicable penalties, and, therefore, are acceptable.

2.5 Safety Analyses (Non-LOCA)

The design basis events considered in this safety analysis are classified in two groups: The anticipated operational occurrences (moderate frequency and infrequent events) and the limiting fault events i.e., postulated accidents. All events were evaluated with respect to four criteria: fuel performance (centerline melt), reactor coolant system pressure, loss of shutdown margin and offsite dose. All events were reevaluated to assure that they meet their respective criteria for Cycle 3. The limiting events for each criterion and those not bounded by the Cycle 2 values were reanalyzed. The analytical methodology for the reanalyses are the same as for Palo Verde Unit 1 Cycle 2. All of the methodologies used have been reviewed and approved by the NRC. The following list includes the code, the purpose for which it was used in the analyses and the reference:

Code	Purpose	Ref.
CESEC-III	Plant response to non-LOCA events	18
CETOP-D	Hot channel and DNBR	13
TORC	Pin DNBR and RCP shaft seizure	11, 19
CENPD-183	Loss-of-flow methodology analysis	20
HERMITE	Core simulation for space-time kinetics	21

The input parameters for the analyses were comparable to those for the reference cycle. Whenever the core protection system trip was evoked in the sequence the instrument channel response times assumed were conservative relative to the Cycle 3 Technical Specifications.

All of the events evaluated are bounded by the reference cycle.

2.6 ECCS Analyses

An ECCS analysis was performed for the limiting break size LOCA for Cycle 3 to demonstrate compliance with the requirements of 10 CFR 50.46. The methodology is the same as for the Cycle 2 analysis (Ref. 23). The analysis justifies a 13.5 Kw/ft peak linear heat generation rate. For Cycle 3, since there have been no significant changes in hardware characteristics, only clad temperatures and oxidation are required in this reevaluation. The code STRIKIN-II was used for this purpose (Ref. 24). The performance data were generated with the FATES-3A fuel evaluation code (Refs. 6 and 7). It was demonstrated that the double ended guillotine break with a discharge coefficient of 1.0 is the limiting size. Similarly the limiting burnup, i.e., with the highest fuel stored energy, was found to be 1000 MWD/MTU. The ECCS analysis methods discussed above have been previously approved and are acceptable.

2.6.1 Large LOCA Analysis

The input data compared to the reference cycle were conservative. The results for the limiting double ended guillotine break showed a peak clad temperature of 1944°F, peak clad oxidation of 5.4% and total core-wide oxidation less than .80%. All these values are within the required 10 CFR 50.46 limits of 2,200°F, 17.0% and 1.0% respectively, Therefore, we find the large LOCA analysis results to be acceptable.

2.6.2 Small Break LOCA Analysis

Review of the Cycle 3 fuel and core data confirmed that the small break LOCA analysis results are bounded by the corresponding results of the reference cycle.

3.0 TECHNICAL SPECIFICATION CHANGES

This section provides a summary of the proposed amendments to the Palo Verde Unit 1 Technical Specifications for the Cycle 3 operation. A brief description, justification and acceptability for each Technical Specification (TS) change is provided in the following.

TS Figure 3.1-1A: The proposed change raises the required shutdown margin for cold and hot shutdown conditions from 3.5% delta-k/k to 4.0% delta-k/k to accommodate the requirements for inadvertent deboration. This change is necessary to satisfy regulatory requirements and thus, is acceptable.

TS Tables 3.1-2, 3.1-3 and 3.1-5: The proposed changes increase the monitoring frequency for backup boron dilution detection to ensure that the time criteria for detection and correction of a boron dilution event remain the same as the reference cycle. As such these proposed changes are acceptable.

TS Figures 3.1-3 and 3.1-4: The proposed changes revise the curves of the transient insertion limit lines. These changes are required to make the Technical Specifications consistent with the Cycle 3 Safety analyses. Thus, the proposed changes are acceptable.

TS Figure 3.2-1A: The proposed change relaxes the azimuthal power tilt operating limits with the core operating limit supervisory system in operation, to avoid lengthy delays in increasing power. When the core operating limit supervisory system is in operation, reactor operation within the analysis limits is assured, therefore, the proposed amendment is acceptable.

TS Figures 3.2-2 and 3.2-2A: The proposed changes revise the DNBR limit curves for combinations of CEACs inoperable with COLSS inoperable. These revisions are required to reflect cycle-specific parameter changes due to core loadings. The changes are required to ensure that the Technical Specifications are consistent with the safety analyses for Cycle 3, and thus, are acceptable.

4.0 STARTUP TESTING

The licensee presented a description of the planned startup testing, which includes: low power physics, ascension to power and procedures if acceptance criteria are not met. The objective of the testing is to verify that the core performance is consistent with the design and safety analyses. The program conforms to the requirements of the ANSI/ANS-19.6.1, 1985 and supplements the normal surveillance requirements of the Technical Specifications (Refs. 25 & 26). The low power physics tests include: initial criticality, critical boron concentration, temperature reactivity coefficient, control element assembly reactivity worth and inverse boron worth. The power ascension testing includes: flux symmetry verification, core power distribution, shape annealing matrix, boundary point power correlation coefficient, radial peaking factors, control element assembly shadowing factor, reactivity coefficient at power and critical boron concentration. These tests will provide reasonable assurance that the core has been loaded in accordance with the safety analysis assumptions. They are therefore acceptable.

Should any of the startup tests reveal any unreviewed safety issues the NRC will be notified.

5.0 SUMMARY

We have reviewed the submitted information in support of the Palo Verde Unit 1 Cycle 3 operation. The review covered fuels, physics, thermal hydraulics, accident and transient analyses, technical specification revisions and startup test procedures.

Based on the evaluations presented in the preceding sections we find the proposed reload acceptable.

6.0 CONTACT WITH STATE OFFICIAL

The Arizona Radiation Regulatory Agency has been advised of the proposed determination of no significant hazards consideration with regard to these changes. No comments were received.

7.0 ENVIRONMENTAL CONSIDERATION

The amendment involves changes in the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amount, and no significant change in the type, of any effluent that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued proposed findings that the amendment involves no significant hazard consideration, and there has been no public comment on such finding. Accordingly, the amendment meets 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 to be prepared in connection with the issuance of the amendment.

8.0 CONCLUSION

The staff 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. We, therefore, conclude that the proposed changes are acceptable.

Principal contributor: T. Chan

Dated: September 19, 1989

REFERENCES

1. Letter from D.B. Karner, Arizona Nuclear Power Project to USNRC, "Palo Verde Nuclear Generating Station Unit 1, Proposed Reload Technical Specification Changes," dated January 12, 1989.

2. Letter from D.B. Karner, Arizona Nuclear Power Project to USNRC, "Palo Verde Nuclear Generating Station Unit 1, Submittal of the Reload Analysis Report," dated January 18, 1989.

3. Letter from D. B. Karner, Arizona Nuclear Power Project to USNRC, "Palo Verde Nuclear Generating Station-Unit 1, Submittal of Revised Reload Analysis Report," dated April 19, 1989.

4. Letter from D.B. Karner, Arizona Nuclear Power Project to USNRC, "Applicability of RAR References," dated April 26, 1989.

5. Letter from W. F. Conway, Arizona Public Service to USNRC, "Revised Reload Analysis Report Change Pages," dated June 27, 1989.

6. CENPD-139-P-A," C-E Fuel Evaluation Model," Combustion Engineering, dated July 1974.

7. CEN-161(B)-P, "Improvements in the Fuel Evaluation Model," Combustion Engineering, dated July 1981.

8. Letter from R.A. Clark (NRC) to A.E. Lundvall, Jr. (BG&E), "Safety Evaluation of CEN-161 (FATES3)," dated March 31, 1983.

9. CENPD-153P, Rev. 1-P-A, "INCA/CECOR Power Peaking Uncertainty," Combustion Engineering, dated May 1980.

10. CENPD-266-PA, "The ROCS and DIT Computer Codes for Nuclear Design," Combustion Engineering, dated April 1983.

11. CENPD-161-PA, "TORC Code, A Computer Code for Determining the Thermal Margin of a Reactor Core," Combustion Engineering, dated April 1986.

12. CENPD-162-A, "Critical Heat Flux Correlation for C-E Fuel Assemblies with Standard Spacer Grids, Part 1, Uniform Axial Power Distribution" Combustion Engineering, dated September 1976.

13. CEN-160-S, Rev. 1-P, "CETOP Code Structure and Modeling Methods for San Onofre Nuclear Generating Station Unit 2 and 3," Combustion Engineering, dated September 1981.

14. CEN-356-V-PA, Rev. 1-PA, "Modified Statistical Combination of Uncertainties," Combustion Engineering, dated May 1988.

15. CENPD-225-PA, "Fuel and Poison Rod Bowing" Combustion Engineering, dated June 1983.

16. Letter from A.E. Scherer Combustion Engineering to D.G. Eisenhut NRC (Enclosure 1), "Statistical Combination of System Parameter Uncertainties in Thermal Margin Analyses for System 80," dated May 14, 1982.

17. CESSAR SSER 2 Section 4.4.6, "Statistical Combination of Uncertainties," Combustion Engineering.

18. CESEC, "Digital Simulation of a Combustion Engineering Nuclear Steam Supply System," Combustion Engineering enclosure 1-P to LD-82-001, dated January 6, 1982.

19. CENPD-206-P, "TORC Code Verification and Simplified Modeling Methods," Combustion Engineering, dated January 1977.

20. CENPD-183, "Loss of Flow, CE Method for Loss-of-Flow Analysis," Combustion Engineering, dated July 1975.

21. CENPD-188-A, "HERMITE, Space Time Kinetics," Combustion Engineering, dated July 1975.

22. CENPD-199-PA, Rev. 1P, "CE Setpoint Methodology," Combustion Engineering, dated July 1975.

23. CENPD-132-P, "Calculative Methods for the CE Large Break LOCA Evaluation Model," Combustion Engineering, dated August 1974. Also Supplements 1 and 2 dated December 1974 and July 1975 respectively.

24. CENPD-135-P, "STRIKIN-II, A Cylindrical Geometry Fuel Rod Heat Transfer Program," Combustion Engineering, dated April 1974. Also Supplements 2P and 4P dated February 1975 an August 1975 respectively.

25. ANSI/ANS-19.6.1-1985, "Reload Startup Physics Tests for Pressurized Water Reactors."

26. CEN-319, "Control Rod Group Exchange Technique," Combustion Engineering, dated November 1985.

27. Letter from William F. Conway, Arizona Public Service Co. to USNRC, "Revised Section 7 of Reload Analysis Report for Unit 1, Cycle 3," dated August 25, 1989.

28. Letter from William F. Conway, Arizona Public Service Co. to USNRC, "Revision to Section 8 of Reload Analysis," dated September 11, 1989.

May 23, 1989

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

Mr. William F. Conway
Executive Vice President
Arizona Nuclear Power Project
Post Office Box 52034
Phoenix, Arizona 85072-2034

DHagan
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PDS Plant File

Dear Mr. Conway:

SUBJECT: ISSUANCE OF AMENDMENT NO. 43 TO FACILITY OPERATING LICENSE NO. NPF-41, AMENDMENT NO. 28 TO FACILITY OPERATING LICENSE NO. NPF-51 AND AMENDMENT NO. 17 TO FACILITY OPERATING LICENSE NO. NPF-74 FOR THE PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 (TAC NOS. 71148, 71149 AND 71150)

The Commission has issued the subject Amendments, which are enclosed, to the Facility Operating Licenses for Palo Verde Nuclear Generating Station, Units 1, 2, and 3. The Amendments consist of changes to the Technical Specifications (Appendix A to each license) in response to your application transmitted by letter dated November 9, 1988.

The Amendments revise Palo Verde Nuclear Generating Station (PVNGS) Technical Specification Section 3/4.4.5, "Reactor Coolant System Leakage," by changing the operability requirements of the containment radioactivity monitoring systems and the associated Action Statement.

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

Sincerely,

/s/

Terence L. Chan, Senior Project Manager
Project Directorate V
Division of Reactor Projects III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 43 to NPF-41
2. Amendment No. 28 to NPF-51
3. Amendment No. 17 to NPF-74
4. Safety Evaluation

cc: See next page

*See previous concurrence

DRSP/PDV/LA	DRSP/PDV/PM*	SPLP	OGC*	DRSP/D:PDV
JLee	TChan:rw	for JCraig	JM	GKnighton
5/ /89	4/26/89	5/18/89	5/8/89	5/25/89

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

May 23, 1989

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

Mr. William F. Conway
Executive Vice President
Arizona Nuclear Power Project
Post Office Box 52034
Phoenix, Arizona 85072-2034

Dear Mr. Conway:

SUBJECT: ISSUANCE OF AMENDMENT NO. 43 TO FACILITY OPERATING LICENSE NO. NPF-41, AMENDMENT NO. 28TO FACILITY OPERATING LICENSE NO. NPF-51 AND AMENDMENT NO. 17 TO FACILITY OPERATING LICENSE NO. NPF-74 FOR THE PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 (TAC NOS. 71148, 71149 AND 71150)

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Terence L. Chan, Senior Project Manager
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4. Safety Evaluation

cc: See next page

Mr. William F. Conway
Arizona Nuclear Power Project

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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. 43
License No. NPF-41

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

   A. The application for amendment, dated November 9, 1988 by the Arizona Public Service Company (APS) 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 (licensees), 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 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;

   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 enclosure 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.43 , 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.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

George W. Knighton, Director
Project Directorate V
Division of Reactor Projects III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
Changes to the Technical
Specifications

Date of Issuance: May 23, 1989

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 43 TO FACILITY OPERATING LICENSE NO. NPF-41

DOCKET NO. STN 50-528

Replace the following page of the Appendix A Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains vertical lines indicating the areas of change. Also to be replaced is the following overleaf page to the amended page.

Amendment Page	Overleaf Page
3/4 4-18	3/4 4-17

3/4.4.5 REACTOR COOLANT SYSTEM LEAKAGE

LEAKAGE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.5.1 The following Reactor Coolant System leakage detection systems shall be OPERABLE:

a. Either the containment atmosphere gaseous radioactivity or containment atmosphere particulate radioactivity monitoring system, and

b. The containment sump level and flow monitoring system.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With either/or both the containment atmosphere gaseous radioactivity and containment atmosphere particulate radioactivity monitors INOPERABLE, operation may continue for up to 30 days provided the containment sump level and flow monitoring system is OPERABLE and gaseous and/or particulate grab samples of the containment atmosphere are obtained at least once per 12 hours and analyzed within the subsequent 3 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With the containment sump level and flow monitoring system INOPERABLE, operation may continue for up to 30 days provided the containment atmosphere gaseous radioactivity monitoring and the containment atmosphere particulate radioactivity monitoring systems are OPERABLE; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.5.1 The leakage detection systems shall be demonstrated OPERABLE by:

a. Containment atmosphere gaseous and particulate monitoring system-performance of CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST at the frequencies specified in Table 4.3-3,

b. Containment sump level and flow monitoring system-performance of CHANNEL CALIBRATION at least once per 18 months.

TABLE 4.4-2

STEAM GENERATOR TUBE INSPECTION

1ST SAMPLE INSPECTION			2ND SAMPLE INSPECTION		3RD SAMPLE INSPECTION	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S Tubes per S. G.	C-1	None	N. A.	N. A.	N. A.	N. A.
	C-2	Plug defective tubes and inspect additional 2S tubes in this S. G.	C-1	None	N. A.	N. A.
			C-2	Plug defective tubes and inspect additional 4S tubes in this S. G.	C-1	None
					C-2	Plug defective tubes
					C-3	Perform action for C-3 result of first sample
			C-3	Perform action for C-3 result of first sample	N. A.	N. A.
	C-3	Inspect all tubes in this S. G., plug defective tubes and inspect 2S tubes in each other S. G. Notification to NRC pursuant to §50.72 (b)(2) of 10 CFR Part 50	All other S. G.s are C-1	None	N. A.	N. A.
			Some S. G.s C-2 but no additional S. G. are C-3	Perform action for C-2 result of second sample	N. A.	N. A.
			Additional S. G. is C-3	Inspect all tubes in each S. G. and plug defective tubes. Notification to NRC pursuant to §50.72 (b)(2) of 10 CFR Part 50	N. A.	N. A.

$S = 3\frac{N}{n}\%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

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. 28
License No. NPF-51

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

   A. The application for amendment, dated November 9, 1988 by the Arizona Public Service Company (APS) 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 (licensees), 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 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;

   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 enclosure 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.28 , 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.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

George W. Knighton

George W. Knighton, Director
Project Directorate V
Division of Reactor Projects III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
Changes to the Technical
Specifications

Date of Issuance: May 23, 1989

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 28 TO FACILITY OPERATING LICENSE NO. NPF-51

DOCKET NO. STN 50-529

Replace the following page of the Appendix A Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains vertical lines indicating the areas of change. Also to be replaced is the following overleaf page to the amended page.

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3/4.4.5 REACTOR COOLANT SYSTEM LEAKAGE

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a. Either the containment atmosphere gaseous radioactivity or containment atmosphere particulate radioactivity monitoring system, and

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APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With either/or both the containment atmosphere gaseous radioactivity and containment atmosphere particulate radioactivity monitors INOPERABLE, operation may continue for up to 30 days provided the containment sump level and flow monitoring system is OPERABLE and gaseous and/or particulate grab samples of the containment atmosphere are obtained at least once per 12 hours and analyzed within the subsequent 3 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With the containment sump level and flow monitoring system INOPERABLE, operation may continue for up to 30 days provided the containment atmosphere gaseous radioactivity monitoring and the containment atmosphere particulate radioactivity monitoring systems are OPERABLE; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.5.1 The leakage detection systems shall be demonstrated OPERABLE by:

a. Containment atmosphere gaseous and particulate monitoring system-performance of CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST at the frequencies specified in Table 4.3-3,

b. Containment sump level and flow monitoring system-performance of CHANNEL CALIBRATION at least once per 18 months.

TABLE 4.4-2

STEAM GENERATOR TUBE INSPECTION

1ST SAMPLE INSPECTION			2ND SAMPLE INSPECTION		3RD SAMPLE INSPECTION	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S Tubes per S. G.	C–1	None	N. A.	N. A.	N. A.	N. A.
	C–2	Plug defective tubes and inspect additional 2S tubes in this S. G.	C–1	None	N. A.	N. A.
			C–2	Plug defective tubes and inspect additional 4S tubes in this S. G.	C–1	None
					C–2	Plug defective tubes
					C–3	Perform action for C–3 result of first sample
			C–3	Perform action for C–3 result of first sample	N. A.	N. A.
	C–3	Inspect all tubes in this S. G., plug defective tubes and inspect 2S tubes in each other S. G. Notification to NRC pursuant to §50.72 (b)(2) of 10 CFR Part 50	All other S. G.s are C–1	None	N. A.	N. A.
			Some S. G.s C–2 but no additional S. G. are C–3	Perform action for C–2 result of second sample	N. A.	N. A.
			Additional S. G. is C–3	Inspect all tubes in each S. G. and plug defective tubes. Notification to NRC pursuant to §50.72 (b)(2) of 10 CFR Part 50	N. A.	N. A.

$S = 3\frac{N}{n}\%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

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.17
License No. NPF-74

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

   A. The application for amendment, dated November 9, 1988 by the Arizona Public Service Company (APS) 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 (licensees), 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 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;

   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 enclosure 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.17 , 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.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

George W. Knighton, Director
Project Directorate V
Division of Reactor Projects III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
Changes to the Technical
Specifications

Date of Issuance: May 23, 1989

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 17 TO FACILITY OPERATING LICENSE NO. NPF-74

DOCKET NO. STN 50-530

Replace the following page of the Appendix A Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains vertical lines indicating the areas of change. Also to be replaced is the following overleaf page to the amended page.

Amendment Page	Overleaf Page
3/4 4-18	3/4 4-17

3/4.4.5 REACTOR COOLANT SYSTEM LEAKAGE

LEAKAGE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.5.1 The following Reactor Coolant System leakage detection systems shall be OPERABLE:

a. Either the containment atmosphere gaseous radioactivity or containment atmosphere particulate radioactivity monitoring system, and

b. The containment sump level and flow monitoring system.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With either/or both the containment atmosphere gaseous radioactivity and containment atmosphere particulate radioactivity monitors INOPERABLE, operation may continue for up to 30 days provided the containment sump level and flow monitoring system is OPERABLE and gaseous and/or particulate grab samples of the containment atmosphere are obtained at least once per 12 hours and analyzed within the subsequent 3 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With the containment sump level and flow monitoring system INOPERABLE, operation may continue for up to 30 days provided the containment atmosphere gaseous radioactivity monitoring and the containment atmosphere particulate radioactivity monitoring systems are OPERABLE; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.5.1 The leakage detection systems shall be demonstrated OPERABLE by:

a. Containment atmosphere gaseous and particulate monitoring system-performance of CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST at the frequencies specified in Table 4.3-3,

b. Containment sump level and flow monitoring system-performance of CHANNEL CALIBRATION at least once per 18 months.

TABLE 4.4-2

STEAM GENERATOR TUBE INSPECTION

1ST SAMPLE INSPECTION			2ND SAMPLE INSPECTION		3RD SAMPLE INSPECTION	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S Tubes per S. G.	C–1	None	N. A.	N. A.	N. A.	N. A.
	C–2	Plug defective tubes and inspect additional 2S tubes in this S. G.	C–1	None	N. A.	N. A.
			C–2	Plug defective tubes and inspect additional 4S tubes in this S. G.	C–1	None
					C–2	Plug defective tubes
					C–3	Perform action for C–3 result of first sample
			C–3	Perform action for C–3 result of first sample	N. A.	N. A.
	C–3	Inspect all tubes in this S. G., plug defective tubes and inspect 2S tubes in each other S. G. Notification to NRC pursuant to §50.72 (b)(2) of 10 CFR Part 50	All other S. G.s are C–1	None	N. A.	N. A.
			Some S. G.s C–2 but no additional S. G. are C–3	Perform action for C–2 result of second sample	N. A.	N. A.
			Additional S. G. is C–3	Inspect all tubes in each S. G. and plug defective tubes. Notification to NRC pursuant to §50.72 (b)(2) of 10 CFR Part 50	N. A.	N. A.

$S = 3\frac{N}{n}\%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 43 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 28 TO FACILITY OPERATING LICENSE NO. NPF-51

AND AMENDMENT NO.17 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

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

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

1.0 INTRODUCTION

By letter dated November 9, 1988 the Arizona Public Service Company (APS) 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 (licensees), requested changes to the Technical Specifications 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 proposed changes would revise Technical Specifications (TS) Section 3/4.4.5, "Reactor Coolant System Leakage" by changing the operability requirements of the containment radioactivity monitoring systems. The action statement is also revised to reflect this change.

2.0 DISCUSSION AND EVALUATION

The existing TS Section 3/4.4.5 for each of the Palo Verde licenses identifies three systems which comprise the Reactor Coolant System Leakage Detection System (RCSLDS):

a. containment atmosphere particulate radioactivity monitoring system

b. containment atmosphere gaseous radioactivity monitoring system, and

c. containment sump level and flow monitoring system

The existing TS Action Statement permits continued operation for up to 30 days if any one of the three monitoring systems becomes inoperable, provided

that grab samples of the containment atmosphere are obtained and analyzed at least once per 24 hours when the required gaseous and/or particulate radioactivity monitoring system is inoperable. This Action Statement requires the plant to shutdown in the event both the gaseous and particulate radioactivity monitoring systems are inoperable, or if either one of the radioactivity monitoring systems and the containment sump level and flow monitoring system are inoperable.

In actuality, there are two independent systems which comprise the RCSLDS. The containment atmosphere gaseous monitor and the containment atmosphere particulate monitor share a common sample point, sample line, isolation valves, sample fan, radiation monitor package and power supply. There are two monitoring systems, one looking at a particulate filter assembly and the other at a gas chamber. Should one of the common components in the system fail, both systems will become inoperable. With the present technical specifications, the unit is required to shut down in 6 hours. However, plant shutdown is unnecessary because adequate capability remains to detect primary system leakage. The containment sump monitoring capabilities are available and containment atmosphere airborne radioactivity levels will be determined using grab samples.

To eliminate this unnecessary shutdown requirement, the licensees propose to revise the operability requirements of the three systems which comprise the RCSLDS to accurately reflect the systems configuration, by requiring the containment sump level and flow monitoring system and either of the two containment atmosphere radioactivity monitors to be operable. In conjunction with this change, the licensees propose to revise the Action Statement to permit continued operation for up to 30 days in the event either/or both containment atmosphere particulate radioactivity and containment atmosphere gaseous monitors are inoperable in order to allow repair or replacement of inoperable components. The proposed Action Statement also requires more frequent sampling (i.e., once every 12 hours rather than once every 24 hours) than the present requirement. As such we find this change to be acceptable.

The proposed Action Statement for inoperable containment sump level and flow monitoring system would permit continued operation for 30 days to allow for repair or replacement of inoperable components if both the gaseous and particulate radioactivity monitoring systems are operable. This is the same requirement as the present technical specifications. Grab samples would not be required because adequate leakage detection is provided by the operable radioactivity monitor without the grab samples. We find this change acceptable.

The proposed change eliminates unnecessary plant shutdowns because of inoperable components common to the containment atmosphere gaseous and particulate radioactivity monitoring systems. It also eliminates an unnecessary sampling procedure when at least one containment radioactivity monitoring system is available for leak detection. Further, the compensatory measure of grab sampling is improved due to the increased sample frequency and prompt analysis requirement. Therefore, we find the proposed technical specification changes to be acceptable.

3.0 CONTACT WITH STATE OFFICIAL

The Arizona Radiation Regulatory Agency has been advised of the proposed determination of no significant hazards consideration with regard to these changes. No comments were received.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments involve changes in the installation or use of facility components located within the restricted area as defined in 10 CFR 20. The staff has determined that the amendments involve no significant increase in the amount, and no significant change in the type, of any effluent that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued proposed findings that the amendments involve no significant hazard consideration, and there has been no public comment on such finding. 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 to be prepared in connection with the issuance of the amendments.

5.0 CONCLUSION

The staff 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. We, therefore, conclude that the proposed changes are acceptable.

Principal contributor: T. Chan

Dated: May 23, 1989