September 19, 1989

Docket Nos. 50-528

DISTRIBUTION
Docket File
NRC & LPDRs
PD5 Reading
MVirgilio
JLee
TChan
MDavis
OGC
D. Hagan
E. Jordan
T. Meek (4)
Wanda Jones
J. Calvo
ACRS (10)
GPA/PA
OC/LFMB
Region V (4)

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. 44 TO FACILITY OPERATING LICENSE NO. NPF-41, PALO VERDE NUCLEAR GENERATING STATION, UNIT 1, (TAC NO. 71873)

The Commission has issued the subject Amendments, which are enclosed, to the Facility Operating Licenses for Palo Verde Nuclear Generating Station, Unit 1. The Amendment consists of changes to the Technical Specifications (Appendix A to the license) in response to your application transmitted by letter dated January 12, 1989, as supplemented by the supporting Reload Analysis Report dated January 18, 1989, as clarified by letters dated April 19, and 26, June 27, August 25, and September 11, 1989.

The Amendment revises those portions of the Technical Specifications regarding Shutdown Margin, Control Element Assembly Insertion Limits, Azimuthal Power Tilt Allowance, and Departure form Nucleate Boiling Ratio Margin, in support of Cycle 3 operation for Palo Verde, Unit 1.

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 Terence Chan

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

DF01

Enclosures:
1. Amendment No. 44 to NPF-41
2. Safety Evaluation

cc: See next page
*See previous concurrence

DRSP/PD5*	DRSP/PD5*	RXB/DEST*	OGC*	DRSP/PD5
JLee	TChan:rw	MWHodges	CBarth	GWRighton
8/31/89	8/29/89	9/7/89	9/5/89	9/19/89

OFFICIAL RECORD COPY 9/8/89
[TAC 71873]

Docket Nos. 50-528

DISTRIBUTION
Docket File
NRC & LPDRs
PD5 Reading
MVirgilio
JLee
TChan
MDavis
OGC
D. Hagan
E. Jordan
T. Meek (4)
Wanda Jones
J. Calvo
ACRS (10)
GPA/PA
OC/LFMB
Region V (4)

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. TO FACILITY OPERATING LICENSE NO. NPF-41, PALO VERDE NUCLEAR GENERATING STATION, UNIT 1, (TAC NO. 71873)

The Commission has issued the subject Amendment, which is enclosed, to the Facility Operating License for Palo Verde Nuclear Generating Station, Unit 1. The Amendment consists of changes to the Technical Specifications (Appendix A to the license) in response to your application transmitted by letter dated January 12, 1989, as supplemented by the supporting Reload Analysis Report dated January 18, 1989, as clarified by letters dated April 19 and 26, June 27, and August 25, 1989.

The Amendment revises those portions of the Technical Specifications regarding Shutdown Margin, Control Element Assembly Insertion Limits, Azimuthal Power Tilt Allowance, and Departure from Nucleate Boiling Ratio Margin, in support of Cycle 3 operation for Palo Verde, Unit 1.

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,

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. to NPF-41
2. Safety Evaluation

cc: See next page

DRSP/PD5	DRSP/PD5	RXB/DEST	OGC	DRSP/D:PD5
JLee	TChan:rw	MWHodges		GWKnighton
8/31/89	8/29/89	9/7/89	9/5/89	8/ /89

OFFICIAL RECORD COPY

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

September 19, 1989

Docket Nos. 50-528

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.44 TO FACILITY OPERATING LICENSE NO. NPF-41, PALO VERDE NUCLEAR GENERATING STATION, UNIT 1, (TAC NO. 71873)

The Commission has issued the subject Amendments, which are enclosed, to the Facility Operating Licenses for Palo Verde Nuclear Generating Station, Unit 1. The Amendment consists of changes to the Technical Specifications (Appendix A to the license) in response to your application transmitted by letter dated January 12, 1989, as supplemented by the supporting Reload Analysis Report dated January 18, 1989, as clarified by letters dated April 19, and 26, June 27, August 25, and September 11, 1989.

The Amendment revises those portions of the Technical Specifications regarding Shutdown Margin, Control Element Assembly Insertion Limits, Azimuthal Power Tilt Allowance, and Departure form Nucleate Boiling Ratio Margin, in support of Cycle 3 operation for Palo Verde, Unit 1.

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,

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.44 to NPF-41
2. Safety Evaluation

cc: See next page

cc:

Arthur C. Gehr, Esq.
Snell & Wilmer
3100 Valley Center
Phoenix, Arizona 85073

Charles R. Kocher, Esq. Assistant
Council
James A. Boeletto, Esq.
Southern California Edison Company
P. O. Box 800
Rosemead, California 91770

Mr. Tim Polich
U.S. Nuclear Regulatory Commission
HC-03 Box 293-NR
Buckeye, Arizona 85326

Regional Administrator, Region V
U. S. Nuclear Regulatory Commission
1450 Maria Lane
Suite 210
Walnut Creek, California 94596

Mr. Charles B. Brinkman
Washington Nuclear Operations
Combustion Engineering, Inc.
12300 Twinbrook Parkway, Suite 330
Rockville, Maryland 20852

Mr. Charles Tedford, Director
Arizona Radiation Regulatory Agency
4814 South 40 Street
Phoenix, Arizona 85040

Chairman
Maricopa County Board of Supervisors
111 South Third Avenue
Phoenix, Arizona 85003

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. 44
License No. NPF-41

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

   A. The application for amendment, dated January 12, 1989 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 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. 44, 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: September 19, 1989

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 44 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. Also to be replaced are the following overleaf pages to the amended pages.

Amendment Pages	Overleaf Pages
3/4 1-2a	--
3/4 1-17	--
3/4 1-18	--
3/4 1-20	3/4 1-19
3/4 1-31	--
3/4 1-32	--
3/4 2-4a	--
3/4 2-7	--
3/4 2-7a	--

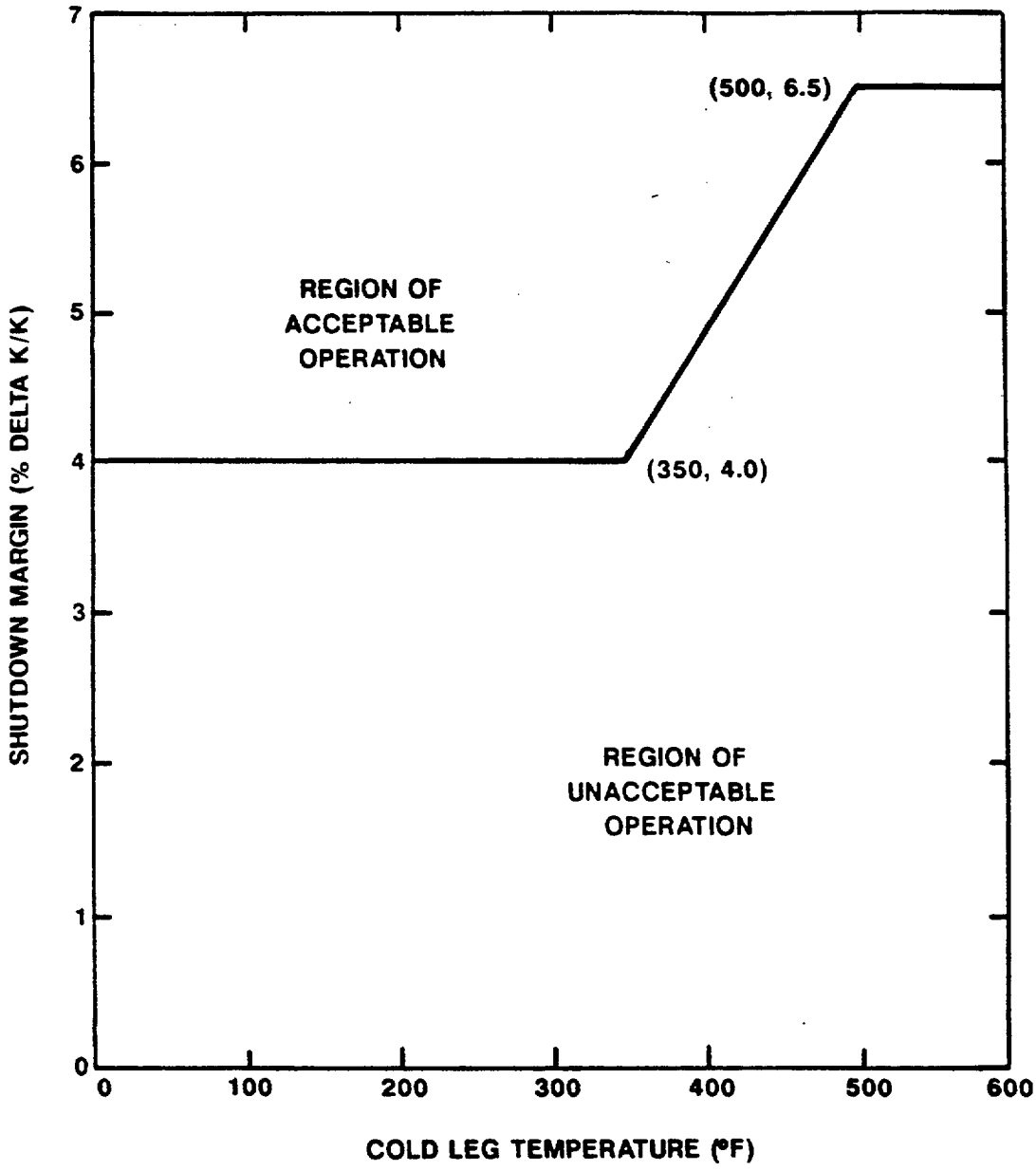


FIGURE 3.1-1A

SHUTDOWN MARGIN vs. COLD LEG TEMPERATURE

TABLE 3.1-2

REQUIRED MONITORING FREQUENCIES FOR BACKUP BORON DILUTION DETECTION AS A FUNCTION OF OPERATING CHARGING PUMPS AND PLANT OPERATIONAL MODES FOR $0.98 > \bar{K}_{eff} > 0.97$

OPERATIONAL MODE	Number of Operating Charging Pumps			
	0	1	2	3
3	12 hours	2.0 hours	0.5 hours	ONA
4 not on SCS	12 hours	2.5 hours	1 hour	0.5 hours
5 not on SCS	8 hours	2.5 hours	1 hour	0.5 hours
4 & 5 on SCS	8 hours	0.5 hours	ONA	ONA

Notes: SCS = Shutdown Cooling System
ONA = Operation not allowed

TABLE 3.1-3

REQUIRED MONITORING FREQUENCIES FOR BACKUP BORON DILUTION DETECTION AS A FUNCTION OF OPERATING CHARGING PUMPS AND PLANT OPERATIONAL MODES FOR $0.97 > K_{eff} > 0.96$

OPERATIONAL MODE	Number of Operating Charging Pumps			
	0	1	2	3
3	12 hours	3.5 hours	1.5 hours	0.5 hours
4 not on SCS	12 hours	3.5 hours	1.5 hours	1 hour
5 not on SCS	8 hours	3.5 hours	1.5 hours	1 hour
4 & 5 on SCS	8 hours	1 hour	0.5 hours	ONA

Notes: SCS = Shutdown Cooling System
ONA = Operation not allowed

TABLE 3.1-4

REQUIRED MONITORING FREQUENCIES FOR BACKUP BORON DILUTION DETECTION AS A FUNCTION OF OPERATING CHARGING PUMPS AND PLANT OPERATIONAL MODES FOR $0.96 > K_{eff} > 0.95$

OPERATIONAL MODE	Number of Operating Charging Pumps			
	0	1	2	3
3	12 hours	5 hours	2 hours	1 hour
4 not on SCS	12 hours	5 hours	2 hours	1 hour
5 not on SCS	8 hours	5 hours	2 hours	1 hour
4 & 5 on SCS	8 hours	2 hours	0.5 hours	ONA

Notes: SCS = Shutdown Cooling System
ONA = Operation not allowed

TABLE 3.1-5

REQUIRED MONITORING FREQUENCIES FOR BACKUP BORON DILUTION DETECTION AS A FUNCTION OF OPERATING CHARGING PUMPS AND PLANT OPERATIONAL MODES FOR $K_{eff} < 0.95$

OPERATIONAL MODE	Number of Operating Charging Pumps			
	0	1	2	3
3	12 hours	6 hours	2.5 hours	1.5 hours
4 not on SCS	12 hours	6 hours	3 hours	1.5 hours
5 not on SCS	8 hours	6 hours	3 hours	1.5 hours
4 & 5 on SCS	8 hours	2 hours	1 hour	0.5 hours
6	24 hours	8 hours	4 hours	2 hours

Note: SCS = Shutdown Cooling System

FIGURE 3.1-3

CEA INSERTION LIMITS vs. THERMAL POWER

(COLSS IN SERVICE)

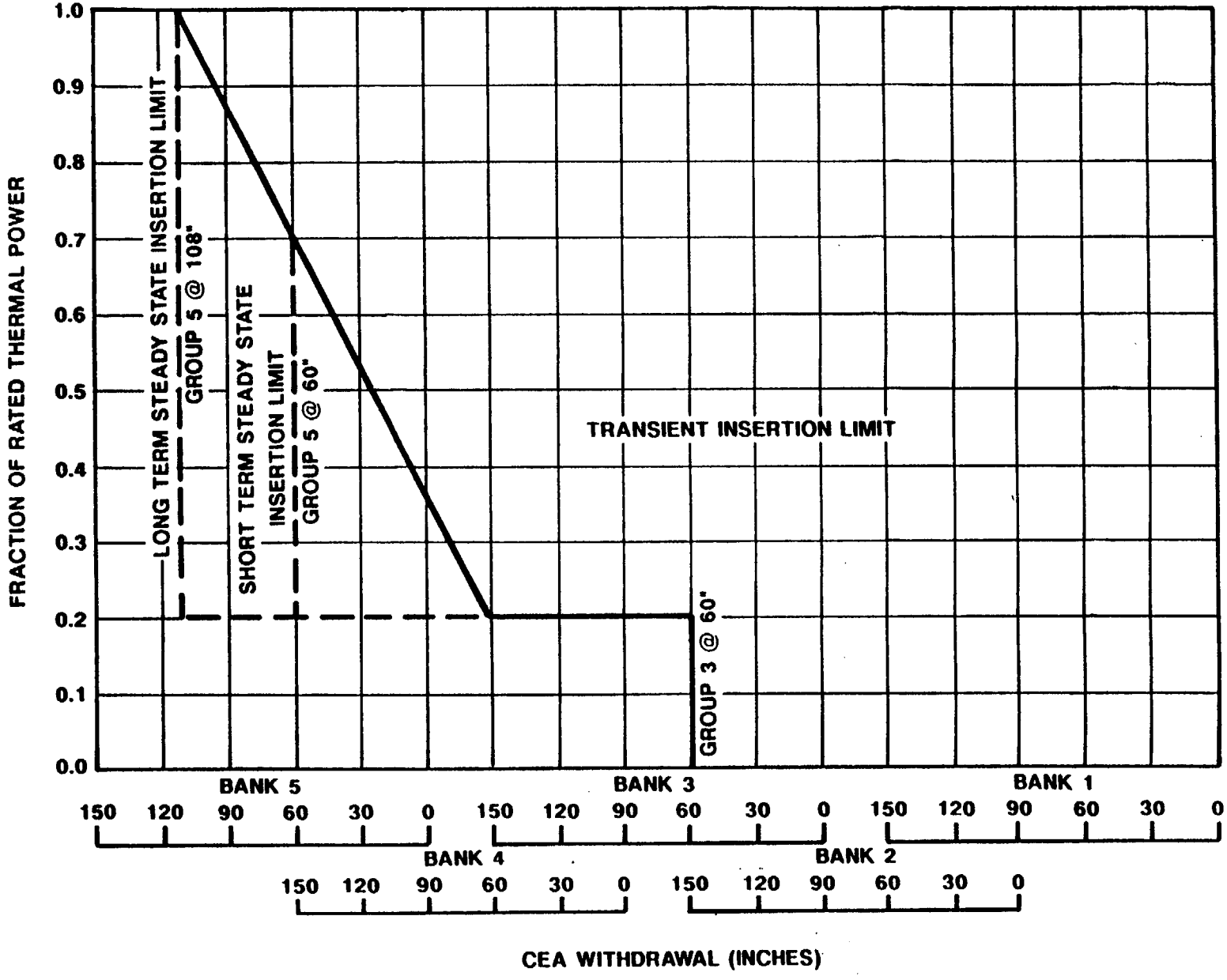
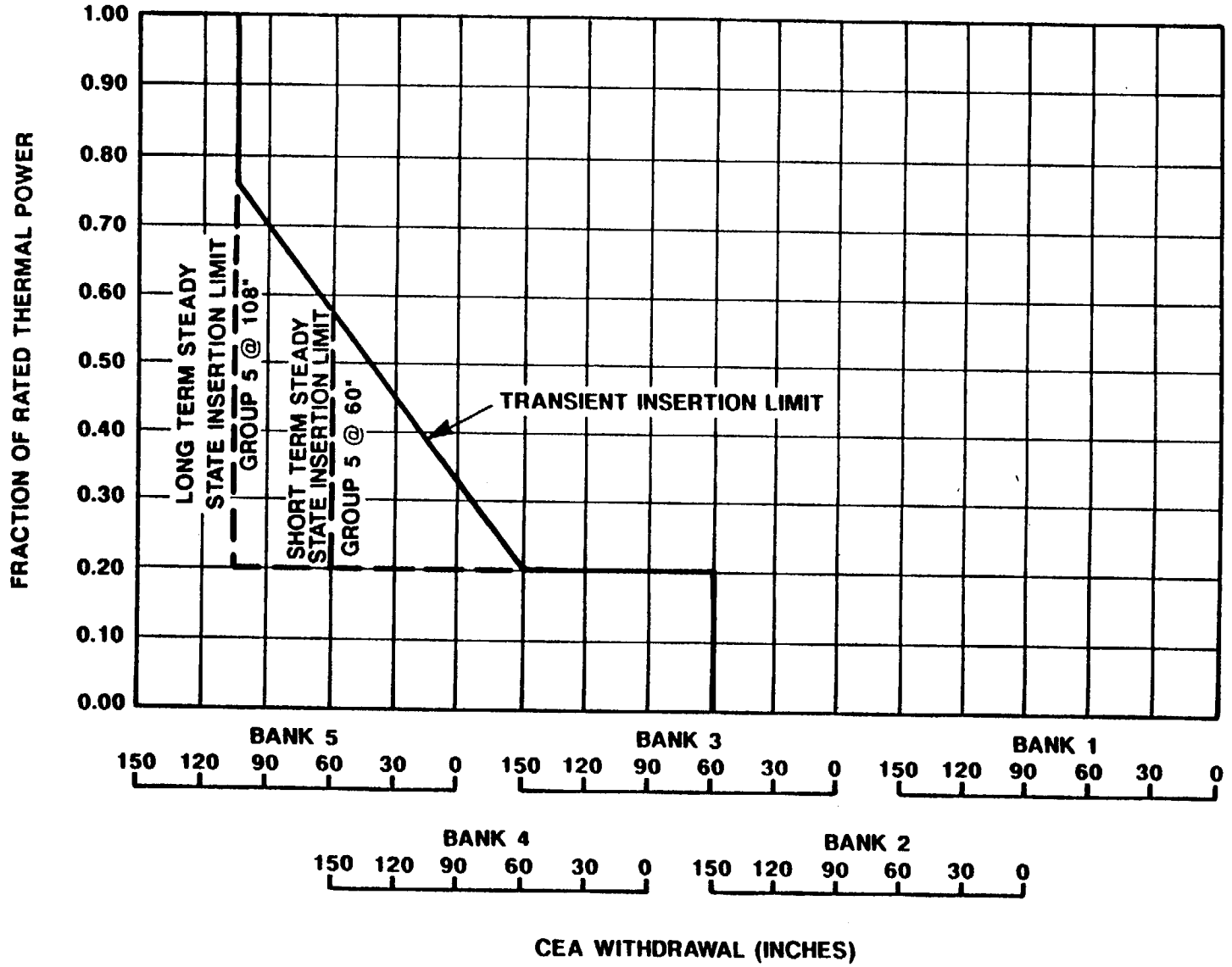


FIGURE 3.1-4

CEA INSERTION LIMITS vs. THERMAL POWER
(COLSS OUT OF SERVICE)



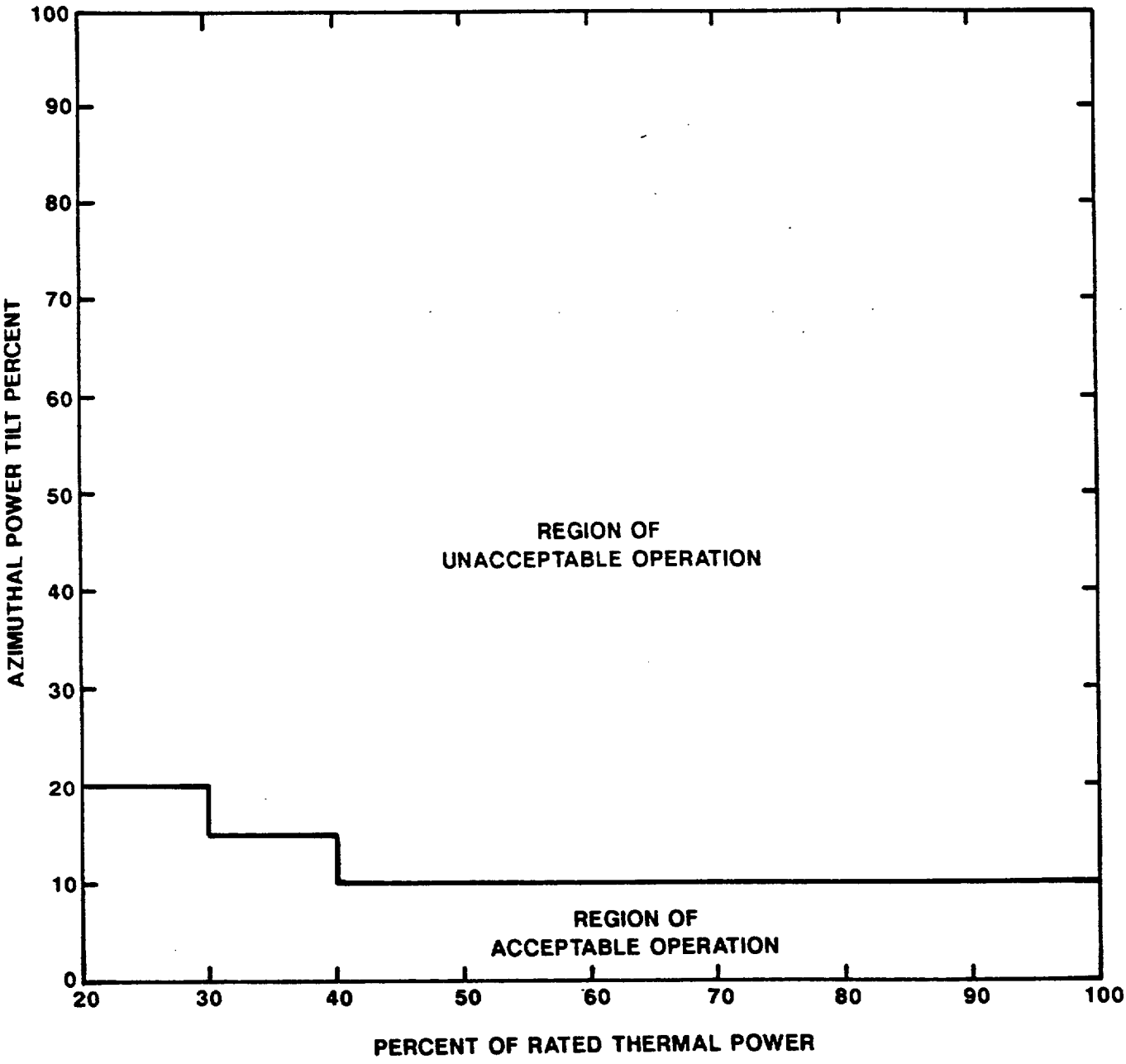


FIGURE 3.2-1A
AZIMUTHAL POWER TILT LIMIT vs. THERMAL POWER
(COLSS IN SERVICE)

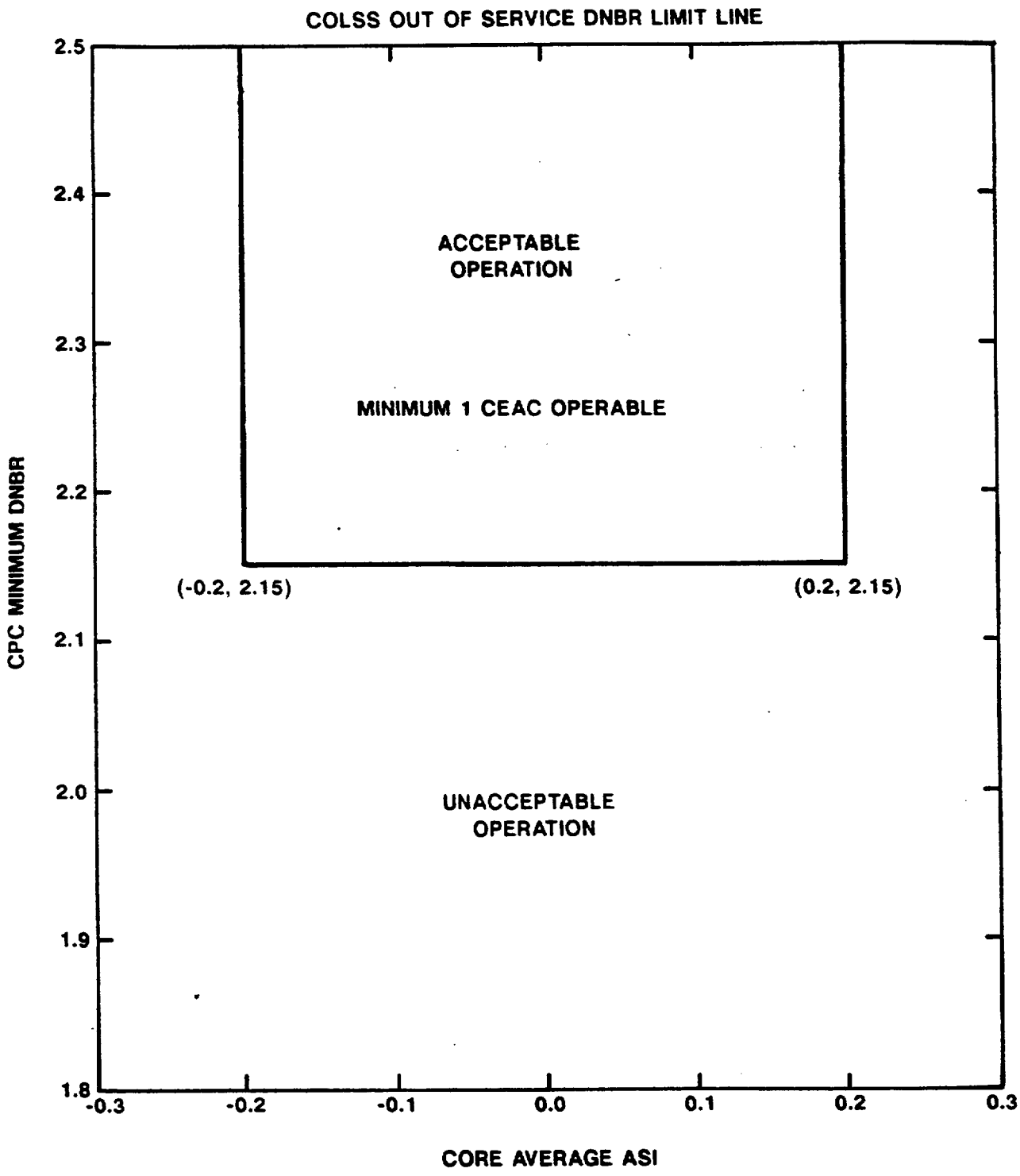


FIGURE 3.2-2

DNBR MARGIN OPERATING LIMIT BASED ON CORE PROTECTION CALCULATORS (COLSS OUT OF SERVICE, CEAC'S OPERABLE)

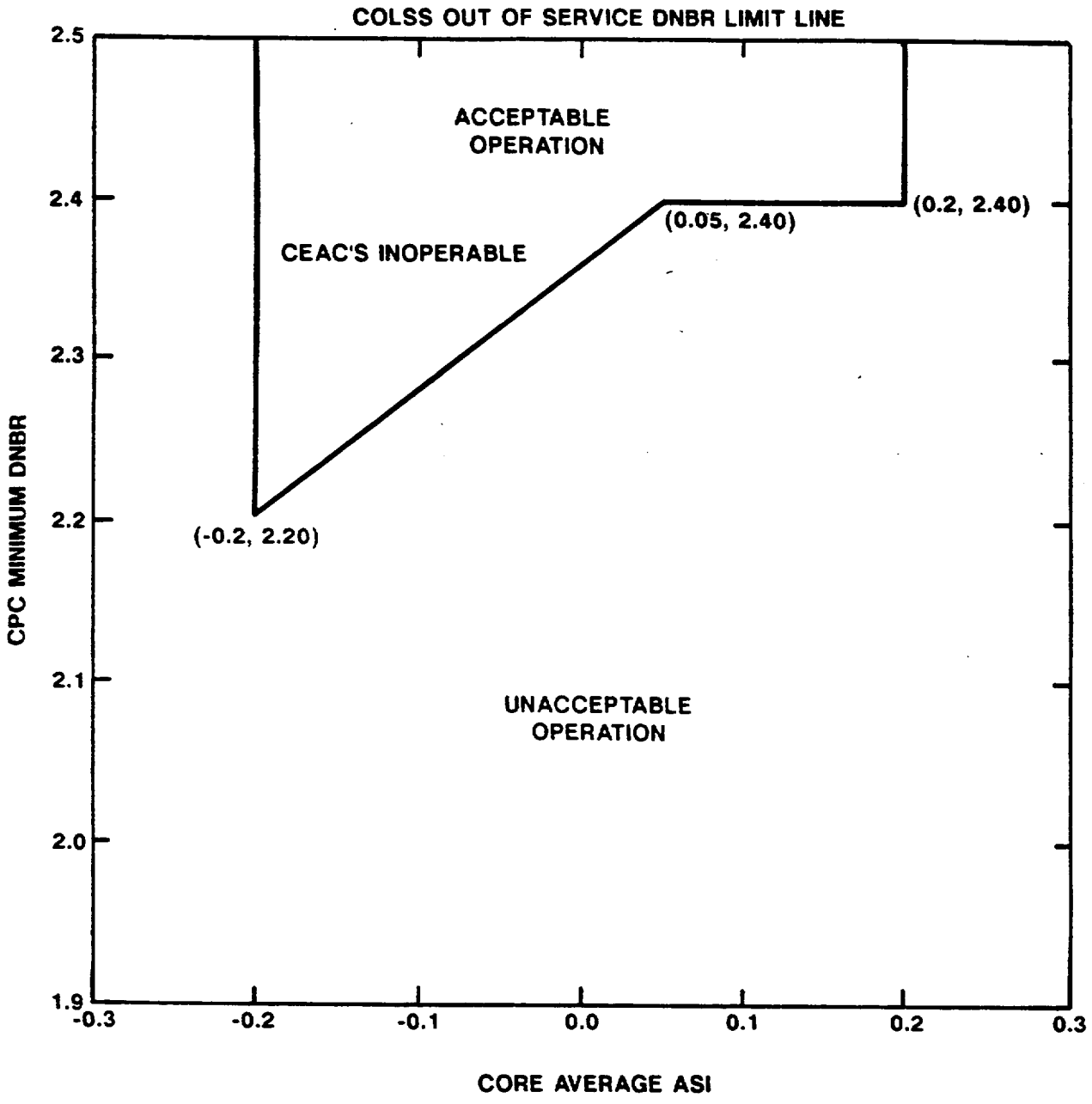


FIGURE 3.2-2a

DNBR MARGIN OPERATING LIMIT BASED ON CORE PROTECTION CALCULATORS (COLSS OUT OF SERVICE, CEAC'S INOPERABLE)

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.