

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9804160395 DOC.DATE: 98/04/03 NOTARIZED: NO DOCKET #
 FACIL: STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Publi 05000528
 AUTH.NAME AUTHOR AFFILIATION
 KRAINIK, A.K. Arizona Public Service Co. (formerly Arizona Nuclear Power
 RECIPIENT AFFILIATION
 RECIP.NAME RECIPIENT AFFILIATION
 Document Control Branch (Document Control Desk)

SUBJECT: Forwards COLR, Unit 1, Rev 3, which was made effective on
 980403. Rev 3 incorporates unit 1 cycle 8 reload design &
 changes axial shape index allowable limits of operation w/
 COLSS operable. Rev replaces pages 1, 2.3 & 6 of COLR, Rev 2.

DISTRIBUTION CODE: A001D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
 TITLE: OR Submittal: General Distribution

NOTES: STANDARDIZED PLANT

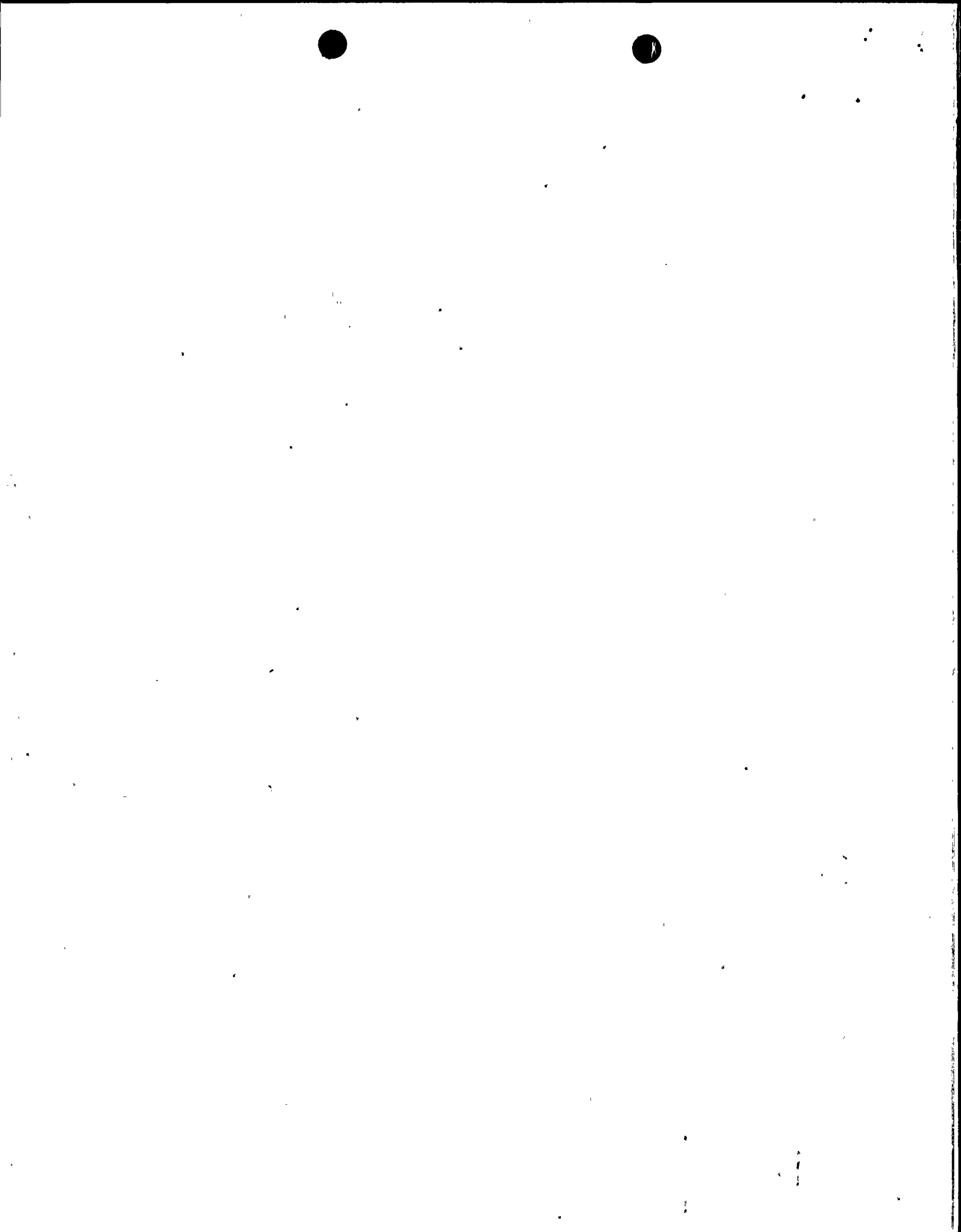
05000528

	RECIPIENT		COPIES			RECIPIENT		COPIES	
	ID	CODE/NAME	LTTR	ENCL		ID	CODE/NAME	LTTR	ENCL
	PD4-2	LA	1	1		PD4-2	PD	1	1
		FIELDS, M	1	1					
INTERNAL:	ACRS		1	1	<u>FILE CENTER</u>	01		1	1
	NRR/DE/ECGB/A		1	1	NRR/DE/EMCB			1	1
	NRR/DRCH/HICB		1	1	NRR/DSSA/SPLB			1	1
	NRR/DSSA/SRXB		1	1	NUDOCS-ABSTRACT			1	1
	OGC/HDS2		1	0					
EXTERNAL:	NOAC		1	1	NRC PDR			1	1

NOTE TO ALL "RIDS" RECIPIENTS:
 PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS
 OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL
 DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTTR 14 ENCL 13

MAY



Arizona Public Service Company

PALO VERDE NUCLEAR GENERATING STATION
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

102-04107-AKK/SAB/RMW
April 3, 1998

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1, Docket No. STN 50-528
Core Operating Limits Report, Unit 1, Revision 3**

Pursuant to PVNGS Unit 1 Technical Specifications, Section 6.9.1.10, enclosed is the Core Operating Limits Report (COLR), Unit 1, Revision 3, which was made effective on April 03, 1998. Revision 3 incorporates the Unit 1 Cycle 8 Reload Design and changes the Axial Shape Index allowable limits of operation with the Core Operating Limit Supervisory System (COLSS) operable. This revision replaces pages 1, 2, 3 and 6 of the COLR, Unit 1, Revision 2. This letter does not make, or imply, any commitments to the NRC.

By copy of this letter and enclosures, this COLR is being provided to the NRC Region IV Administrator, the Walnut Creek Field Office Director, and the PVNGS Senior Resident Inspector.

Please contact Scott A. Bauer at (602) 393-5978 if you have any questions or require additional information.

Sincerely,



Angela K. Krainik
Department Leader
Nuclear Regulatory Affairs

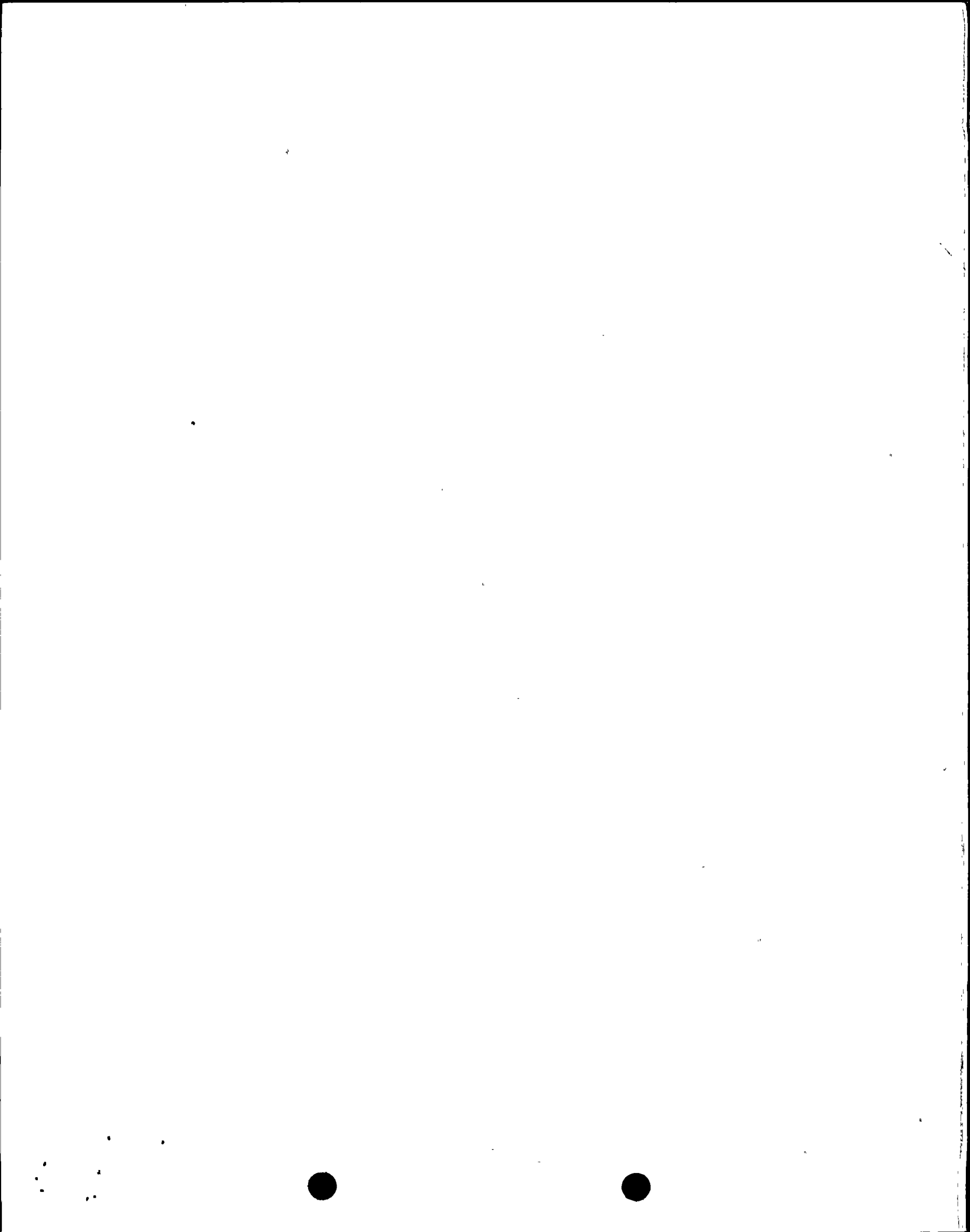
AKK/SAB/RMW/rh

Enclosure

cc: E. W. Merschoff
K. E. Perkins
M. B. Fields
J. M. Moorman

9804160395 980403
PDR ADOCK 05000528
P PDR

///
A001



Enclosure

**Revised Pages of Core Operating Limits Report, Unit 1,
Revision 3**

PVNGS UNIT 1 CORE OPERATING LIMITS REPORT

CORE OPERATING LIMITS REPORT

PALO VERDE NUCLEAR GENERATING STATION (PVNGS)

UNIT 1



PVNGS UNIT 1 CORE OPERATING LIMITS REPORT

Table of Contents

<u>Description</u>	<u>Revision #</u>	<u>Page</u>	
Cover Page	3	1	3
Table of Contents	3	2	
Affected Technical Specifications	0	4	
CORE Operating Limits			
3.1.1.1 Shutdown Margin - Reactor Trip Breakers Open	0	4	
3.1.1.2 Shutdown Margin - Reactor Trip Breakers Closed			
3.1.1.3 Moderator Temperature Coefficient	0	5	
3.1.2.7 Boron Dilution Alarms	0	5	
3.1.3.1 Movable Control Assemblies - CEA Position	0	5	
3.1.3.6 Regulating CEA Insertion Limits	0	5	
3.1.3.7 Part Length CEA Insertion Limits	0	5	
3.2.1 Linear Heat Rate	1	5	
3.2.3 Azimuthal Power Tilt - Tq	0	6	
3.2.4 DNBR Margin	0	6	
3.2.7 Axial Shape Index	3	6	3
3.9.1 Boron Concentration (Mode 6)	0	6	
List of Figures	0	7	
Figure 3.1.1.1-1 Shutdown Margin Versus Cold Leg Temperature Reactor Trip Breakers Open	0	8	
Figure 3.1.1.2-1 Shutdown Margin Versus Cold Leg Temperature Reactor Trip Breakers Closed	0	9	
Figure 3.1.1.3-1 MTC Acceptable Operation, Modes 1 and 2	0	10	
Figure 3.1.3.1-1 Core Power Limit After CEA Deviation	0	11	
Figure 3.1.3.6-1 CEA Insertion Limits Versus Thermal Power (COLSS in Service)	0	12	
Figure 3.1.3.6-2 CEA Insertion Limits Versus Thermal Power (COLSS Out of Service)	0	13	
Figure 3.1.3.7-1 Part Length CEA Insertion Limits Versus Thermal Power	0	14	



1
2
3
4
5

PVNGS UNIT 1 CORE OPERATING LIMITS REPORT
Table of Contents (Continued)

<u>Description</u>	<u>Revision #</u>	<u>Page</u>
Figure 3.2.3-1 Azimuthal Power Tilt Versus Thermal Power (COLSS in Service)	0	15
Figure 3.2.4-1 COLSS DNBR Operating Limit Allowance for Both CEACs Inoperable	0	16
Figure 3.2.4-2 DNBR Margin Operating Limit Based on the Core Protection Calculators (COLSS Out of Service, CEACs Operable)	0	17
Figure 3.2.4-3 DNBR Margin Operating Limit Based on the Core Protection Calculators (COLSS Out of Service, CEACs Inoperable)	0	18
List of Tables	0	19
Table 3.1.2.7-1 Required Monitoring Frequencies for Backup Boron Dilution Detection as a Function of Operating Charging Pumps and Plant Operational Modes for $K_{eff} > 0.98$	0	20
Table 3.1.2.7-2 Required Monitoring Frequencies for Backup Boron Dilution Detection as a Function of Operating Charging Pumps and Plant Operational Modes for $0.98 \geq K_{eff} > 0.97$	0	21
Table 3.1.2.7-3 Required Monitoring Frequencies for Backup Boron Dilution Detection as a Function of Operating Charging Pumps and Plant Operational Modes for $0.97 \geq K_{eff} > 0.96$	0	22
Table 3.1.2.7-4 Required Monitoring Frequencies for Backup Boron Dilution Detection as a Function of Operating Charging Pumps and Plant Operational Modes for $0.96 \geq K_{eff} > 0.95$	0	23
Table 3.1.2.7-5 Required Monitoring Frequencies for Backup Boron Dilution Detection as a Function of Operating Charging Pumps and Plant Operational Modes for $K_{eff} \leq 0.95$	0	24

PVNGS UNIT 1 CORE OPERATING LIMITS REPORT

3.2.3 - Azimuthal Power Tilt - T_q

The AZIMUTHAL POWER TILT (T_q) shall be less than or equal to the limit in Figure 3.2.3-1 with COLSS IN SERVICE.

3.2.4 - DNBR Margin

COLSS IN SERVICE and Both CEACs INOPERABLE - Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operation limit based on DNBR decreased by the allowance shown in Figure 3.2.4-1.

COLSS OUT OF SERVICE and Either One or Both CEACs are OPERABLE - Operating within the region of acceptable operation of Figure 3.2.4-2 using any operable CPC channel.

COLSS OUT OF SERVICE and CEACs INOPERABLE - Operating within the region of acceptable operation of Figure 3.2.4-3 using any operable CPC channel.

3.2.7 - Axial Shape Index

The core average AXIAL SHAPE INDEX (ASI) shall be maintained within the following limits:

COLSS OPERABLE

$-0.18 \leq \text{ASI} \leq 0.16$ for power $\geq 50\%$

$-0.28 \leq \text{ASI} \leq 0.16$ for power $< 50\%$

COLSS OUT OF SERVICE (CPC)

$-0.10 \leq \text{ASI} \leq 0.10$

3.9.1 - Boron Concentration (Mode 6)

The boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained at a uniform concentration ≥ 3000 ppm.



100

100