

Revision 3 Pages

Unit 2 COLR

CORE OPERATING LIMITS REPORT

PALO VERDE NUCLEAR GENERATING STATION (PVNGS)

UNIT 2 CYCLE 7

Revision 3

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

PVNGS UNIT 2 CYCLE 7 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	14
Figure 3.2.4-1 COLSS DNBR Operating Limit Allowance for Both CEAC's Inoperable	0	15
Figure 3.2.4-2 DNBR Margin Operating Limit Based on the Core Protection Calculators (COLSS Out of Service, CEAC's Operable)	0	16
Figure 3.2.4-3 DNBR Margin Operating Limit Based on the Core Protection Calculators (COLSS Out of Service, CEAC's Inoperable)	0	17
List of Tables	0	18
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	19
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	20
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	21
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	22
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	23

PVNGS UNIT 2 CYCLE 7 CORE OPERATING LIMITS REPORT
CORE OPERATING LIMITS - CONTINUED

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 CEAC's 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 CEAC's 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 CEAC's 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

$-0.188 \leq \text{ASI} \leq 0.169$ for power $\geq 50\%$

$-0.288 \leq \text{ASI} \leq 0.169$ for power $< 50\%$

COLSS OUT OF SERVICE (CPC)

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

3

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 ≥ 2500 ppm.

LIST OF FIGURES