

Attachment 1 (13 pages)
March 10, 1997
162-07734-CAH

Unit 3 COLR Revision 0

9704220124 970411
PDR ADDCK 05000530
P PDR

CORE OPERATING LIMITS REPORT

PALO VERDE NUCLEAR GENERATING STATION (PVNGS)

Unit 3

Revision 0

PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

Table of Contents

<u>Description</u>	<u>Revision #</u>	<u>Page</u>
Cover Page	0	1
Table of Contents	0	2
Affected Technical Specifications	0	4
CORE Operating Limits		
3.1.1.1 Shutdown Margin - Reactor Trip Breakers Open		
3.1.1.2 Shutdown Margin - Reactor Trip Breakers Closed		
3.1.2.7 Boron Dilution Alarms		
3.9.1 Boron Concentration (Mode 6)		
List of Figures	0	5
Figure 3.1.1.1-1 Shutdown Margin Versus Cold Leg Temperature Reactor Trip Breakers Open	0	6
Figure 3.1.1.2-1 Shutdown Margin Versus Cold Leg Temperature Reactor Trip Breakers Closed	0	7
List of Tables	0	8
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	9
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	10
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	11

PVNGS UNIT 3 CORE OPERATING LIMITS REPORT
Table of Contents (Continued)

<u>Description</u>	<u>Revision #</u>	<u>Page</u>
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	12
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	13

PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

This Report has been prepared in accordance with the requirements of Technical Specification 6.9.1. The Core Operating Limits have been developed using the NRC approved methodologies specified in Section 6.9.1.10 of the Palo Verde Unit 3 Technical Specifications.

AFFECTED PVNGS TECHNICAL SPECIFICATIONS

- 3.1.1.1 Shutdown Margin - Reactor Trip Breakers Open
- 3.1.1.2 Shutdown Margin - Reactor Trip Breakers Closed
- 3.1.2.7 Boron Dilution Alarms
- 3.9.1 Boron Concentration (Mode 6)

CORE OPERATING LIMITS

The cycle-specific operating limits for the specifications listed are presented below.

3.1.1.1 - Shutdown Margin - Reactor Trip Breakers Open

The Shutdown Margin shall be greater than or equal to that shown in Figure 3.1.1.1-1.

3.1.1.2 - Shutdown Margin - Reactor Trip Breakers Closed

The Shutdown Margin shall be greater than or equal to that shown in Figure 3.1.1.2-1.

3.1.2.7 - Boron Dilution Alarms

With one or both start-up channel high neutron flux alarms inoperable, the RCS boron concentration shall be determined at the applicable monitoring frequency specified in Tables 3.1.2.7-1 through 3.1.2.7-5.

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.

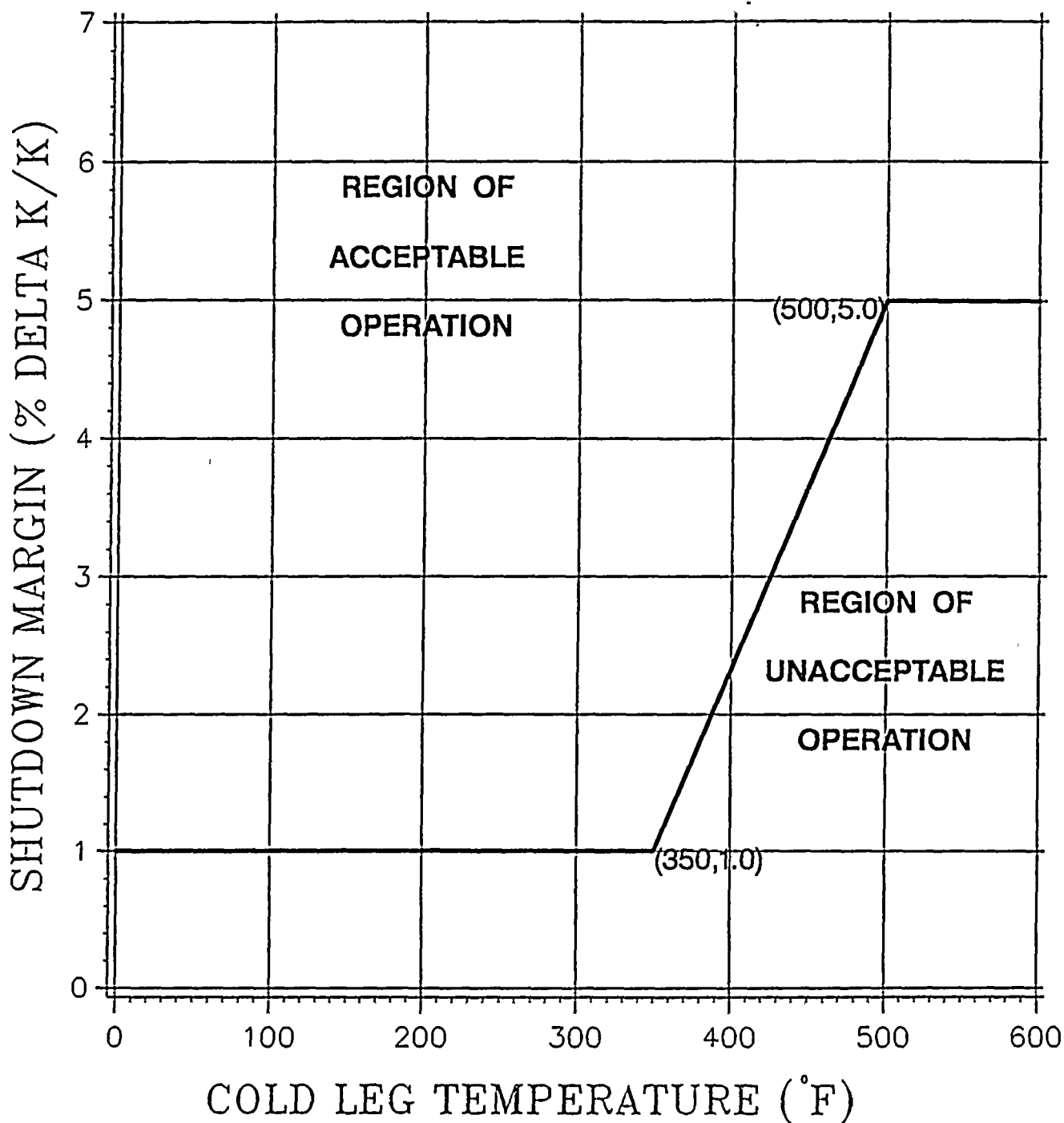
PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

LIST OF FIGURES

- 3.1.1.1-1. Shutdown Margin Versus Cold Leg Temperature, Reactor Trip Breakers Open
- 3.1.1.2-1. Shutdown Margin Versus Cold Leg Temperature, Reactor Trip Breakers Closed

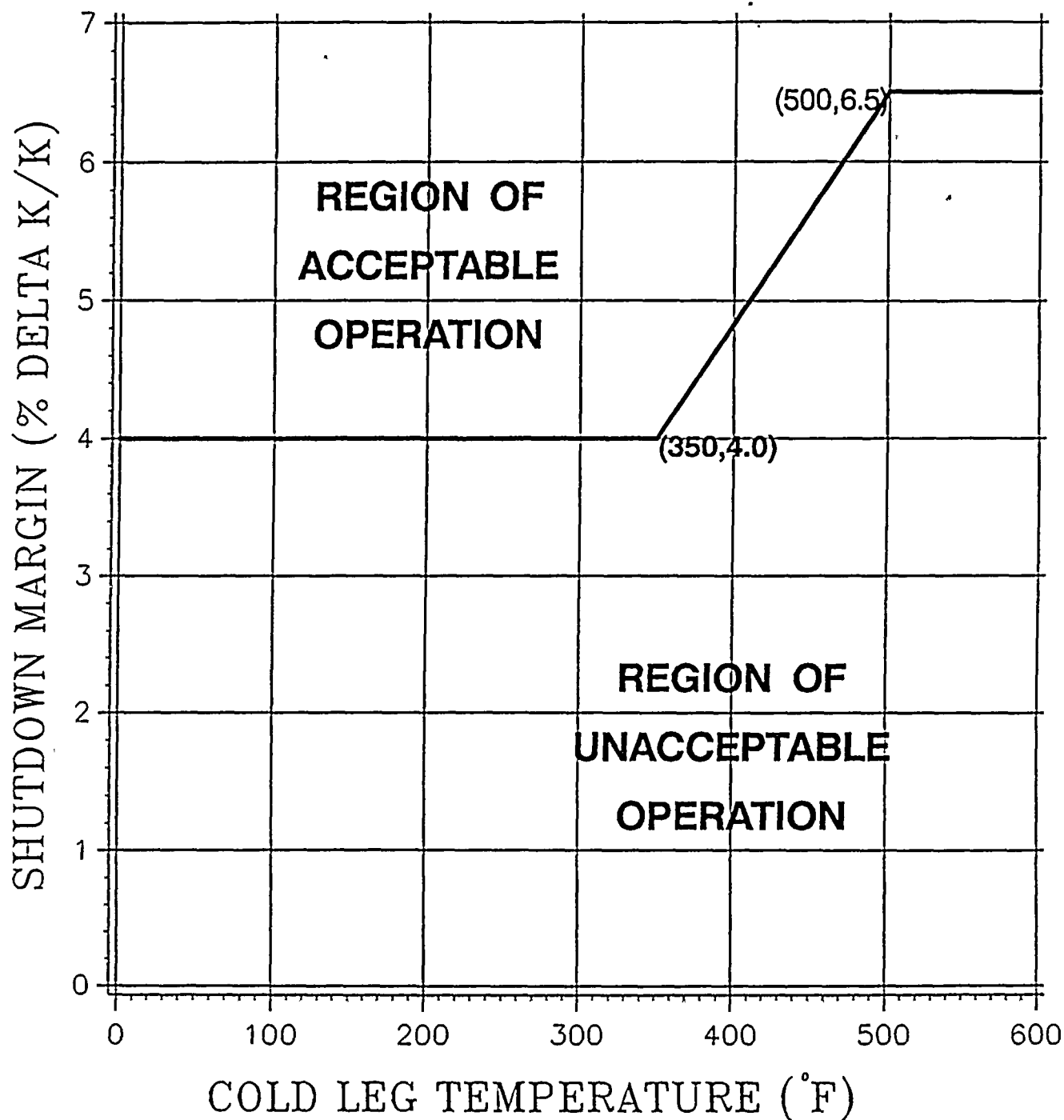
PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

FIGURE 3.1.1.1-1
SHUTDOWN MARGIN VERSUS COLD LEG TEMPERATURE
REACTOR TRIP BREAKERS OPEN



PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

FIGURE 3.1.1.2-1
SHUTDOWN MARGIN VERSUS COLD LEG TEMPERATURE
REACTOR TRIP BREAKERS CLOSED



PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

LIST OF TABLES

- 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 $K_{eff} > 0.98$.
- 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 $0.98 \geq K_{eff} > 0.97$.
- 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 $0.97 \geq K_{eff} > 0.96$.
- 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 $0.96 \geq K_{eff} > 0.95$.
- 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 $K_{eff} \leq 0.95$.

PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

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 $K_{eff} > 0.98$

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

Notes: SCS = Shutdown Cooling System
ONA = Operation Not Allowed

PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

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 $0.98 \geq K_{\text{eff}} > 0.97$

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

Notes: SCS = Shutdown Cooling System
ONA = Operation Not Allowed

PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

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 $0.97 \geq K_{\text{eff}} > 0.96$

OPERATIONAL MODE	Number of Operating Charging Pumps			
	0	1	2	3
3	12 hours	2.5 hours	1 hour	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	1 hour	ONA	ONA

Notes: SCS = Shutdown Cooling System
ONA = Operation Not Allowed



2

PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

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 $0.96 \geq K_{eff} > 0.95$

OPERATIONAL MODE	Number of Operating Charging Pumps			
	0	1	2	3
3	12 hours	3 hours	1 hour	0.5 hours
4 not on SCS	12 hours	3.5 hours	1.5 hours	0.75 hours
5 not on SCS	8 hours	3.5 hours	1.5 hours	0.75 hours
4 & 5 on SCS	8 hours	1.5 hours	0.5 hours	ONA

Notes: SCS = Shutdown Cooling System
ONA = Operation Not Allowed

PVNGS UNIT 3 CORE OPERATING LIMITS REPORT

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 $K_{eff} \leq 0.95$

OPERATIONAL MODE	Number of Operating Charging Pumps			
	0	1	2	3
3	12 hours	4 hours	1.5 hours	1 hour
4 not on SCS	12 hours	4.5 hours	2 hours	1 hour
5 not on SCS	8 hours	4.5 hours	2 hours	1 hour
4 & 5 on SCS	8 hours	2 hours	0.75 hours	ONA
6	24 hours	1.5 hours	ONA	ONA

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