

CORE OPERATING LIMITS REPORT

PALO VERDE NUCLEAR GENERATING STATION (PVNGS)

UNIT 1 CYCLE 6

Revision 1

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REVISION HISTORY

| <u>Revision</u> | <u>Date</u> | <u>Pages</u> |
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CORE OPERATING LIMITS REPORT

PALO VERDE NUCLEAR GENERATING STATION (PVNGS) UNIT 1 CYCLE 6

This Core Operating Limits Report for PVNGS Unit 1 Cycle 6 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 1 Technical Specifications.

AFFECTED PVNGS TECHNICAL SPECIFICATIONS

- | | | | |
|-----|---------|--|---|
| 1) | 3.1.1.2 | Shutdown Margin - Reactor Trip Breakers Closed | 1 |
| 2) | 3.1.1.3 | Moderator Temperature Coefficient | |
| 3) | 3.1.2.7 | Boron Dilution Alarms | |
| 4) | 3.1.3.1 | Movable Control Assemblies - CEA Position | |
| 5) | 3.1.3.6 | Regulating CEA Insertion Limits | |
| 6) | 3.1.3.7 | Part Length CEA Insertion Limits | |
| 7) | 3.2.1 | Linear Heat Rate | |
| 8) | 3.2.3 | Azimuthal Power Tilt - T_q | |
| 9) | 3.2.4 | DNBR Margin | |
| 10) | 3.2.7 | Axial Shape Index | |
| 11) | 3.9.1 | Boron Concentration | 1 |

CORE OPERATING LIMITS

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

3.1.1.2 - Shutdown Margin - Reactor Trip Breakers Closed

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

3.1.1.3 - Moderator Temperature Coefficient

The moderator temperature coefficient (MTC) shall be within the area of Acceptable Operation shown on Figure 2.

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CORE OPERATING LIMITS - CONTINUED3.2.4 - 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 8.

COLSS OUT OF SERVICE and Either One or Both CEAC's are OPERABLE - Operating within the region of acceptable operation of Figure 9 using any operable CPC channel.

COLSS OUT OF SERVICE and CEAC's INOPERABLE - Operating within the region of acceptable operation of Figure 10 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
 $-0.28 \leq \text{ASI} \leq 0.26$

COLSS OUT OF SERVICE (CPC)
 $-0.20 \leq \text{ASI} \leq 0.20$

3.9.1 - Boron Concentration

The boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained at a uniform concentration greater than or equal to 2350 ppm.

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LIST OF FIGURES

1. Shutdown Margin Versus Cold Leg Temperature, Reactor Trip Breakers Closed | 1
2. MTC Acceptable Operation, Modes 1 and 2.
3. Core Power Limit After CEA Deviation.
4. CEA Insertion Limits Versus Thermal Power (COLSS In Service).
5. CEA Insertion Limits Versus Thermal Power (COLSS Out of Service)
6. Part Length CEA Insertion Limit Versus Thermal Power.
7. Azimuthal Power Tilt Limit Versus Thermal Power (COLSS In Service).
8. COLSS DNBR Power Operating Limit Allowance for Both CEACs Inoperable.
9. DNBR Margin Operating Limit Based on Core Protection Calculators
(COLSS Out of Service, CEACs Operable)
10. DNBR Margin Operating Limit Based on Core Protection Calculators
(COLSS Out of Service, CEACs Inoperable)

PVNGS UNIT 1 CYCLE 6 CORE OPERATING LIMITS REPORT

FIGURE 1

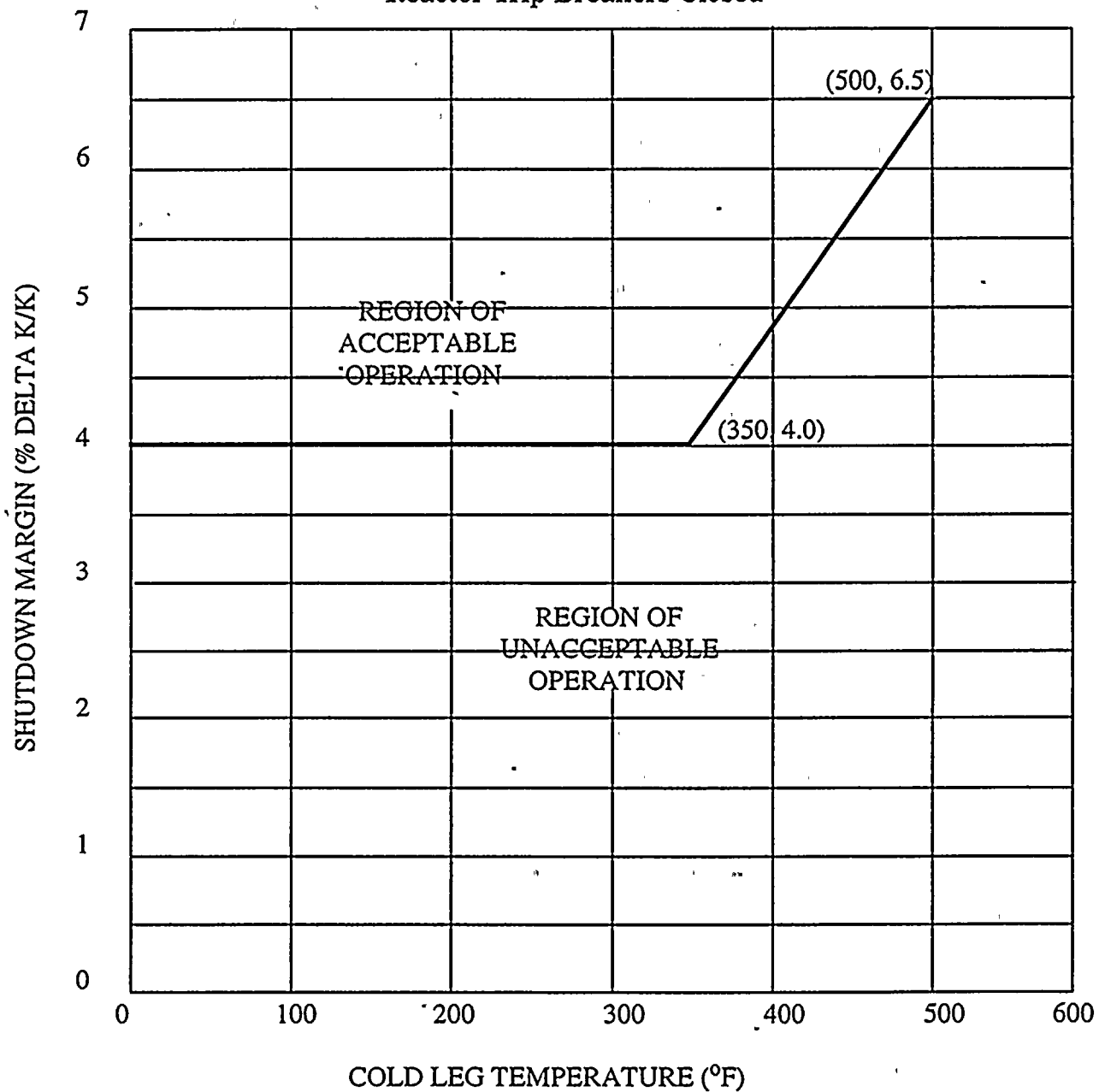
SHUTDOWN MARGIN VERSUS COLD LEG TEMPERATURE
Reactor Trip Breakers Closed

FIGURE 2 - MTC ACCEPTABLE OPERATION, MODES 1 AND 2

