Core Operating Limits Report
Cycle 9
San Onofre Nuclear Generating Station
SONGS Unit 3

3.1 REACTIVITY CONTROL SYSTEMS

LCS 3.1.100 Moderator Temperature Coefficient (MTC)

The MTC shall be > [more positive than] -3.7 E-4 Δk/k/°F at RTP.

AND

The steady state MTC shall be no more positive than the upper MTC limit shown in Figure 3.1.100-1.

VALIDITY STATEMENT: Effective upon start of Cycle 9.

APPLICABILITY: MODES 1 and 2 with $K_{eff} \geq 1.0$

ACTIONS

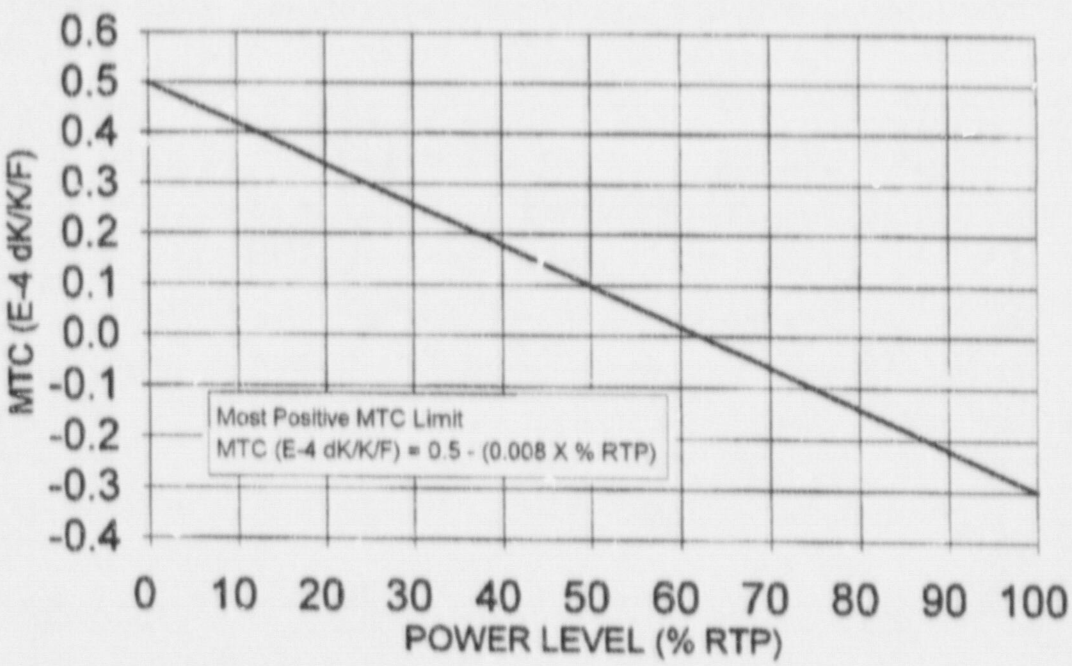
CONDITION	REQUIRED ACTION	COMPLETION TIME
	Refer to LCO 3.1.4	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Refer to LCO 3.1.4	

NOTE: Predicted MTC values shall be adjusted based on Mode 2 measurements to permit direct comparison with Figure 3.1.100-1.

Figure 3.1.100-1
MOST POSITIVE MTC VS. POWER



LCS 3.1.100 Moderator Temperature Coefficient (MTC)

BASES

The limitations on MTC are provided to ensure that the assumptions used in the the accident and transient analysis remain valid throughout each fuel cycle. The limiting events with respect to the MTC limits are; a CEA ejection at the beginning of core life and a main steam line break at the end of core life. The Surveillance Requirements for measurement of the MTC during each fuel cycle are adequate to confirm the MTC value since this coefficient changes slowly due principally to the reduction in RCS boron concentration associated with fuel burnup. The confirmation that the measured MTC value is within its limit provides assurance that the coefficient will be maintained within acceptable values throughout each fuel cycle.

3.1 REACTIVITY CONTROL SYSTEMS

LCS 3.1.102 Regulating CEA Insertion Limits

The regulating CEA groups shall be limited to the withdrawal sequence, and insertion limits specified in Figure 3.1.102-1.

VALIDITY STATEMENT: Effective upon TSIP Implementation.

APPLICABILITY: MODE 1 and 2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	Refer to LCO 3.1.7	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Refer to LCO 3.1.7	

REGULATING CEA WITHDRAWAL VS THERMAL POWER

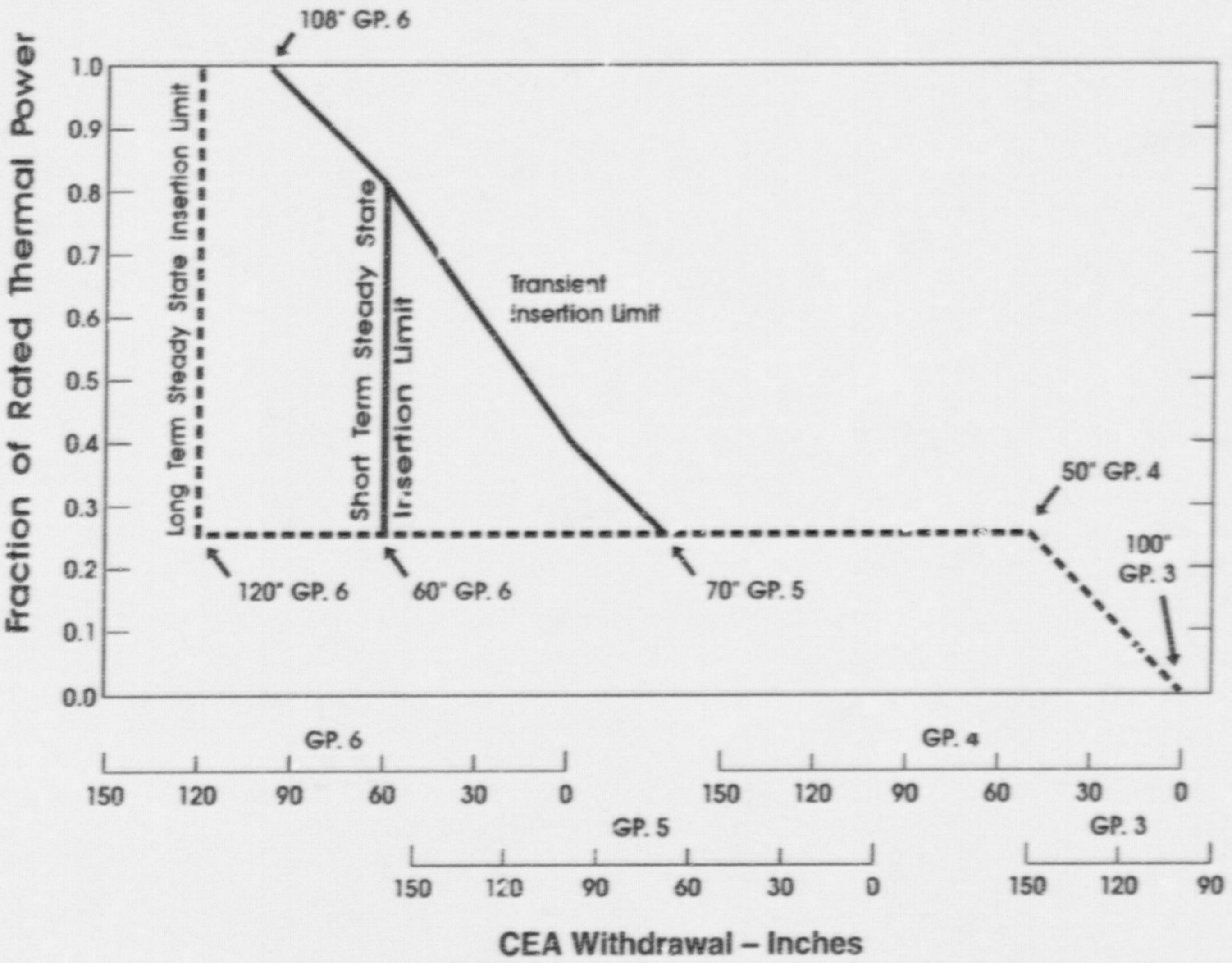


FIGURE 3.1.102-1

LCS 3.1.102 Regulating CEA Insertion Limits

Bases

The Core Operating Limits Report (COLR) Licensee Controlled Specification (LCS) for Regulating Control Element Assembly (CEA) Insertion Limits provides CEA withdrawal sequence and insertion limits while operating in Modes 1 and 2. The long term and short term steady state insertion limits and transient insertion limits for each regulating CEA group are specified graphically as a function of the fraction of rated Thermal Power. These limits ensure that an acceptable power distribution and the minimum shutdown margin is maintained, and the potential effects of CEA misalignment are limited to an acceptable level. Limited deviations from the nominal requirements are permitted with Technical Specification (TS) ACTION statements providing additional compensatory restrictions and time limits. TS Surveillance Requirements provide assurance that necessary system components are OPERABLE and CEA group positions that may approach or exceed acceptable limits are detected, with adequate time for an Operator to take any required Action.

3.1 REACTIVITY CONTROL SYSTEMS

LCS 3.1.103 Part-Length CEA Insertion Limits

The Part-Length CEA groups shall be limited to the insertion limits specified in Figure 3.1.103-1.

VALIDITY STATEMENT: Effective upon TSIP implementation.

APPLICABILITY: MODE 1 > 20% RTP

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
Refer to LCO 3.1.8		

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Refer to LCO 3.1.8	

PART LENGTH CEA INSERTION LIMIT VS THERMAL POWER

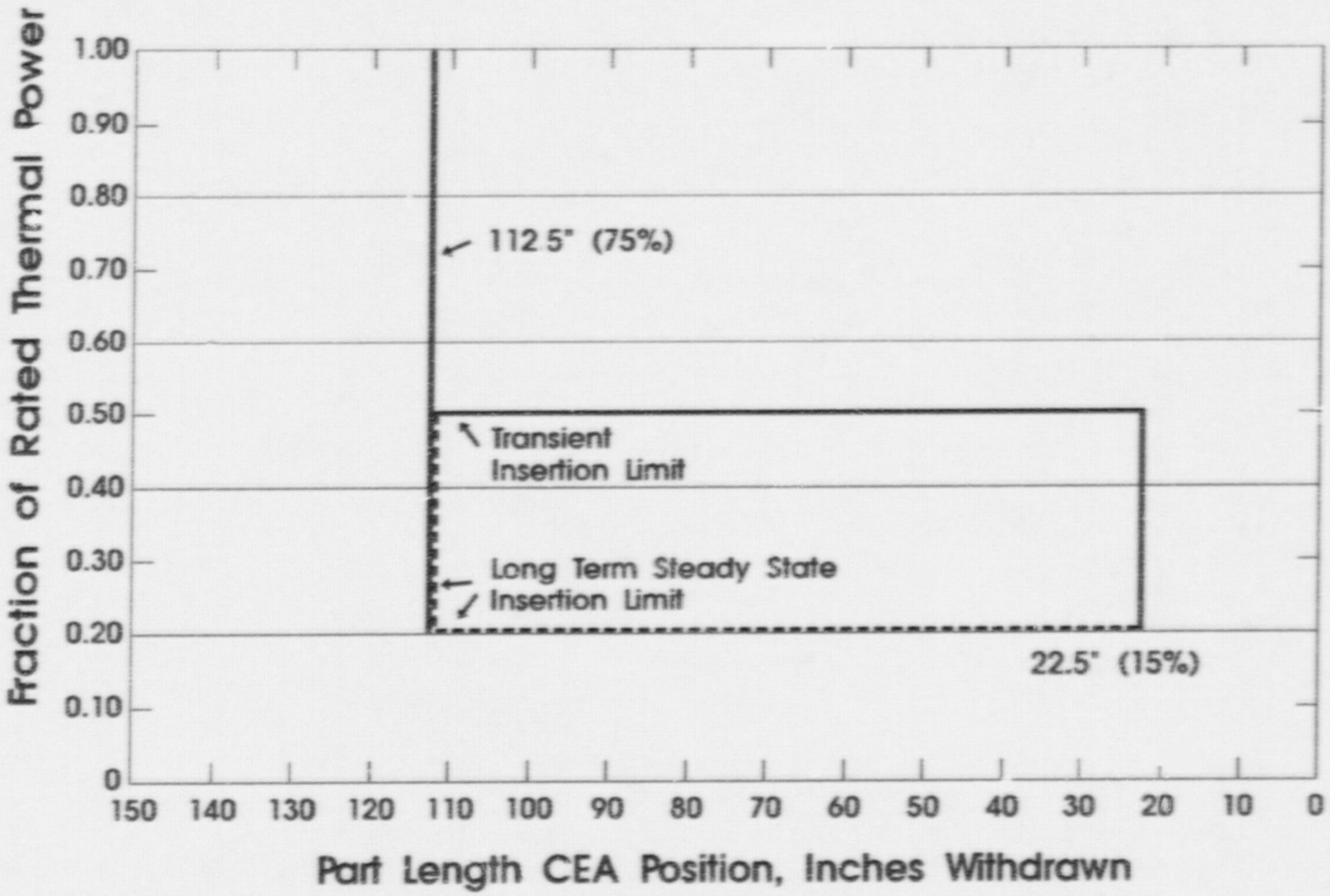


Figure 3.1.103-1

LCS 3.1.103 Part Length CEA Insertion Limits

Bases

The Core Operating Limits Report (COLR) Licensee Controlled Specification (LCS) for Part Length Control Element Assembly (CEA) Insertion Limits provide the part length CEA insertion limits while operating in Mode 1 and reactor power > 20% of RTP. The transient and steady state part length CEA insertion limits are specified graphically as a function of the fraction of rated Thermal Power. The part length CEA limits ensure that safety analysis assumptions for ejected CEA worth and power distribution peaking factors are preserved. Limited deviations from the nominal requirements are permitted with Technical Specification (TS) ACTION statements providing additional compensatory restrictions and time limits. TS Surveillance Requirements provide assurance that necessary system components are OPERABLE and that CEA positions that may approach or exceed acceptable limits are detected, with adequate time for an Operator to take any required Action.

3.1 REACTIVITY CONTROL SYSTEMS

LCS 3.1.105 Control Element Assembly (CEA) Misalignment Power Reduction

All full length CEAs shall be OPERABLE and all full and part length CEAs shall be aligned to within 7 inches of all other CEAs in its group.

VALIDITY STATEMENT: Rev. 1 effective 06/13/97, to be implemented within 30 days

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One non-group 6 full length CEA trippable and misaligned from its group by > 7 inches.	A.1 Initiate THERMAL POWER reduction in accordance with Figure 3.1.105-1 requirements.	In accordance with Figure 3.1.105-1.
B. One group 6 CEA trippable and misaligned from its group by > 7 inches.	B.1 Initiate THERMAL POWER reduction in accordance with Figure 3.1.105-2 requirements.	In accordance with Figure 3.1.105-2.
C. One part length CEA initially ≥ 112.5" misaligned from its group by > 7 inches.	C.1 Initiate THERMAL POWER reduction in accordance with Figure 3.1.105-3 requirements.	In accordance with Figure 3.1.105-3.
D. One part length CEA initially < 112.5" misaligned from its group by > 7 inches.	D.1 Initiate THERMAL POWER reduction in accordance with Figure 3.1.105-4 requirements.	In accordance with Figure 3.1.105-4.

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition A, B, C, or D not met.	E.1 Refer to TS 3.1.5.	In accordance with TS 3.1.5.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Refer to LCO 3.1.5	

REQUIRED POWER REDUCTION AFTER SINGLE NON-GROUP 6
FULL LENGTH CEA DEVIATION*

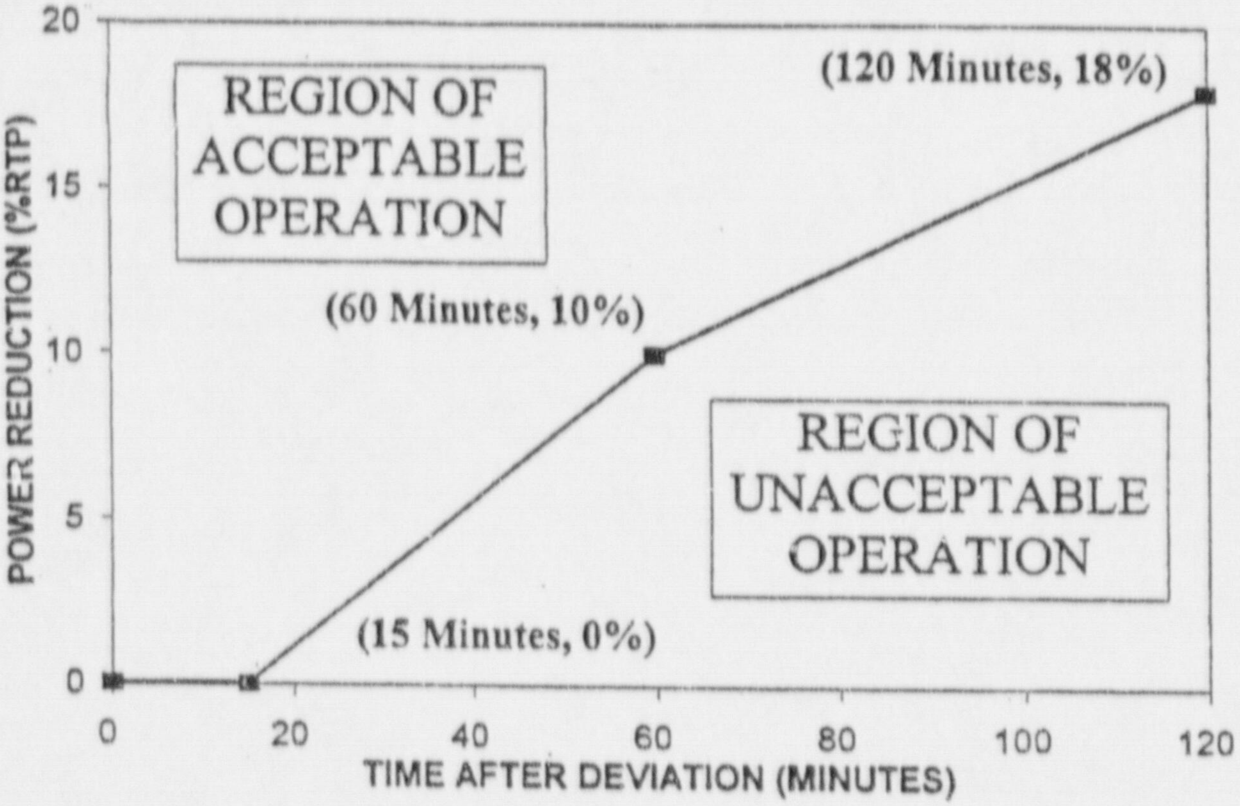


FIGURE 3.1.105-1

* When core power is reduced to 58% of rated power per this limit curve, further reduction is not required by this specification.

REQUIRED POWER RE[illegible]TION AFTER SINGLE GROUP 6
FULL [illegible]H CEA DEVIATION*

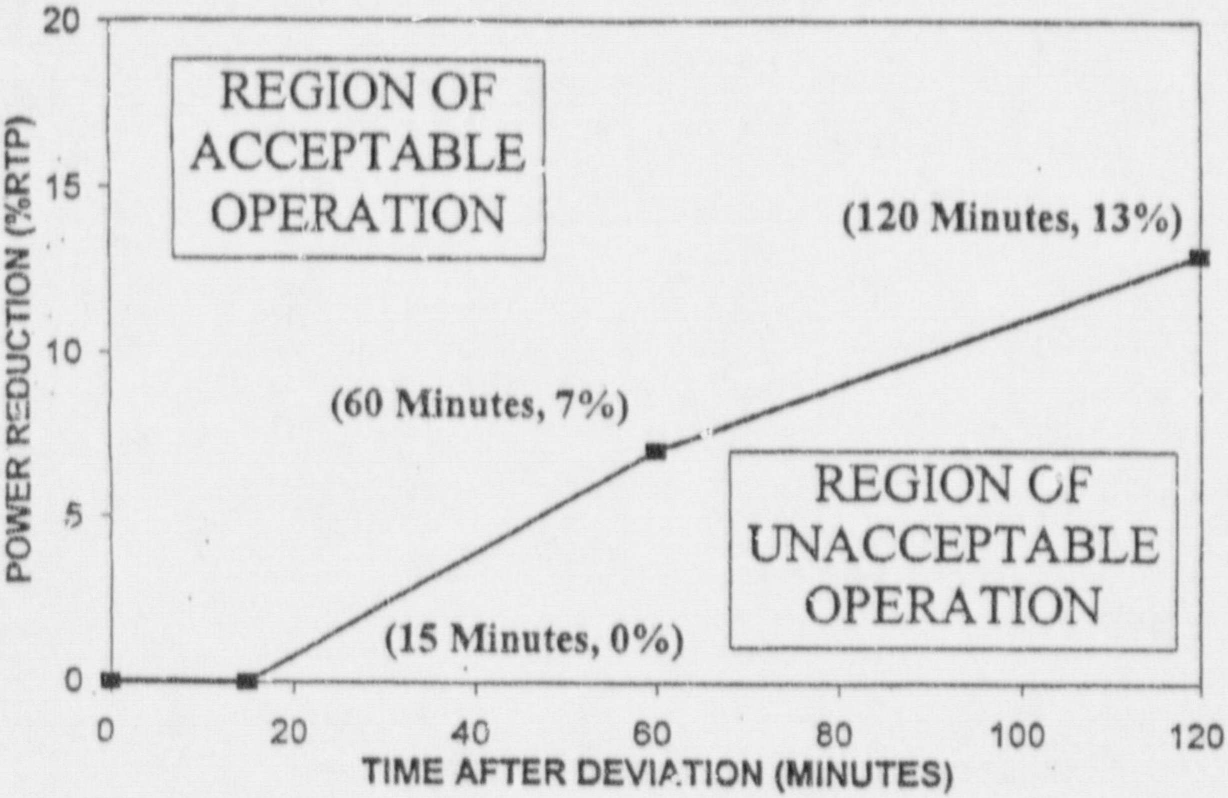


FIGURE 3.1.105-2

* When core power is reduced to 62% of rated power per this limit curve, further reduction is not required by this specification.

REQUIRED POWER REDUCTION AFTER SINGLE
PART LENGTH CEA DEVIATION
(CEA INITIALLY ≥ 112.5 INCHES WITHDRAWN)

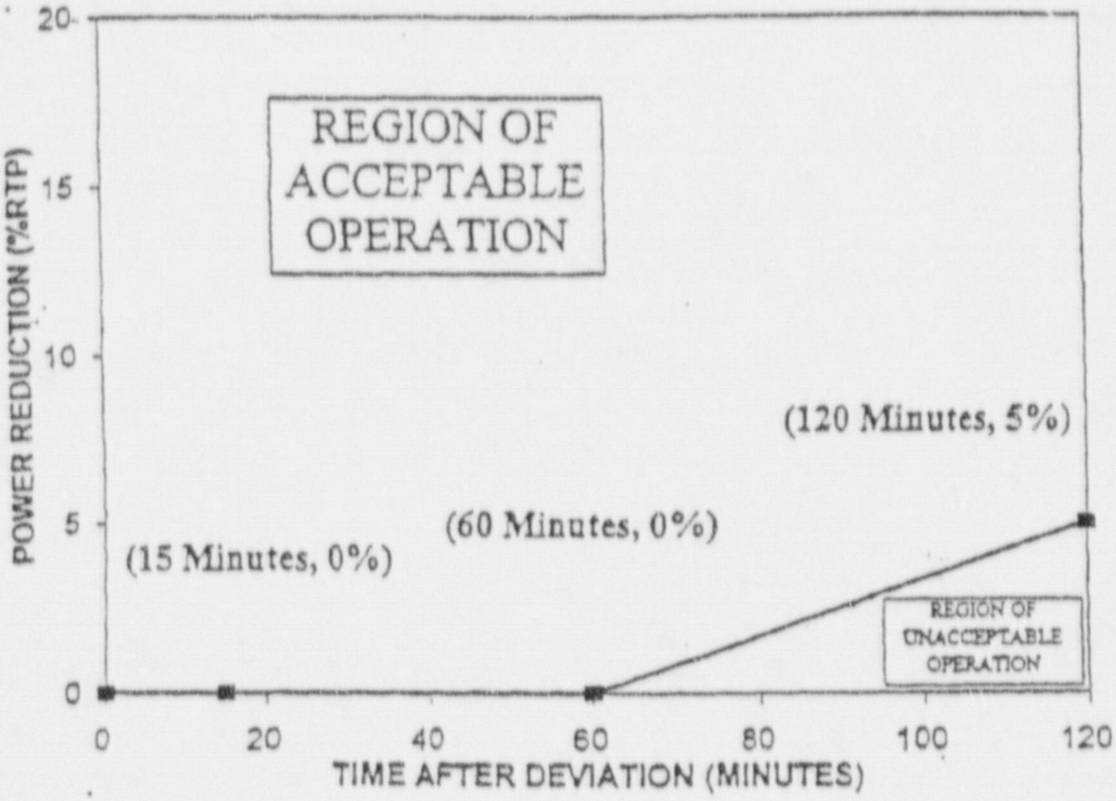


FIGURE 3.1.105-3

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REQUIRED POWER REDUCTION AFTER SINGLE
PART LENGTH CEA DEVIATION*
(CEA INITIALLY < 112.5 INCHES WITHDRAWN)

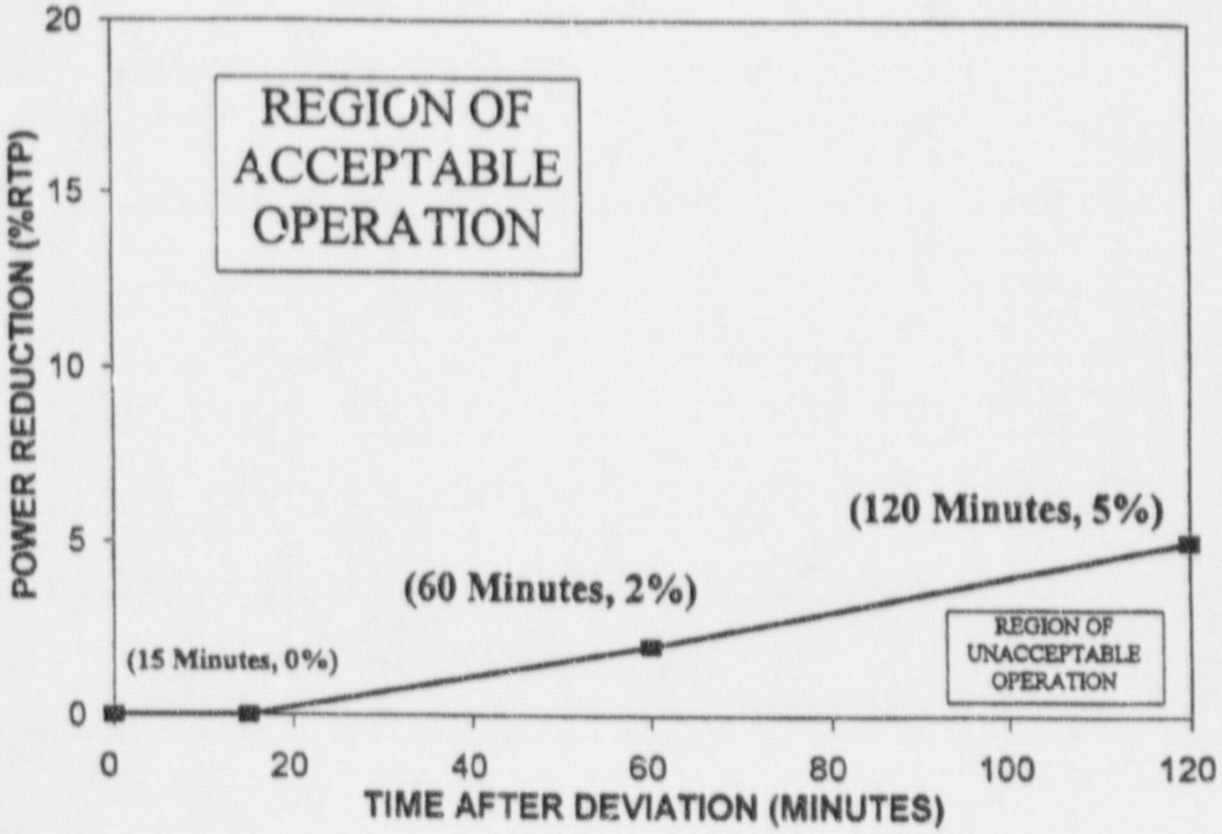

FIGURE 3.1.105-4

* When core power is reduced to 50% of rated power per this limit curve, further reduction is not required by this specification.

LCS 3.1.105 CEA Misalignment Power Reduction

Bases

LCS 3.1.105

The Core Operating Limits Report (COLR) Licensee Controlled Specification (LCS) for Control Element Assembly (CEA) Misalignment Power Reduction provides the power reduction required following a single CEA becoming misaligned from its group by greater than 7 inches while operating in Modes 1 and 2. There are 4 separate power reduction figures provided, with application being dependent on the type of CEA, either "full-length" or "part-length", and the initial position of the "part-length" CEA. For "full-length" CEAs, there are two "sub-types" identified: "non-Group 6" and "Group 6". For "part-length" CEAs, there are two initial conditions identified: "initially ≥ 112.5 inches withdrawn" or "initially < 112.5 inches withdrawn".

The reason for establishing four separate power reduction figures is that full-length group 6 CEAs and/or part-length CEAs are typically used during normal operation. Therefore, a misalignment would most likely involve a CEA in one of these CEA groups. Furthermore, due to the design of the part-length CEAs and their associated insertion limits, it is possible for an inward misalignment to add positive reactivity to the core. Thus, the initial position of a single misaligned part-length CEA must be considered.

The required power reductions are specified graphically as a function of time following the CEA deviation event. For the first 15 minutes, no power reduction is necessary since there is sufficient thermal margin already reserved in the Core Operating Limits Supervisory System (COLSS) or, if COLSS is out-of-service, the amount of thermal margin administratively established by LCS 3.2.101, Departure from Nucleate Boiling Ratio (DNBR). After 15 minutes, a power reduction may be required to increase the thermal margin to offset the build-in of Xenon and its detrimental affect on the radial core power distribution (called "distortion").

Reactor power is required to be reduced to compensate for the increased radial power peaking that occurs following a CEA misalignment. At lower power levels, the potentially adverse consequences of increased radial power peaking can be eliminated.

The magnitudes of the required power reductions differ because of the mechanical design differences between full-length and part-length CEAs and the core physics characteristics due to the fuel load pattern. There are two

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LCS 3.1.105 CEA Alignment Power Reduction

Bases

major mechanical differences between full-length and part-length CEAs: the lengths and types of neutron absorbers. In a part-length CEA, the neutron absorber is Inconel and is positioned entirely in the lower half of the CEA. In a full-length CEA, there are two types of neutron absorbers: silver-indium-cadmium, located in the bottom 12.5 inches of the CEA, and 136 inches of boron carbide, located above the silver-indium-cadmium.

Since Inconel is neutronically less reactive than boron carbide and silver-indium-cadmium, there will be less of a distortion of the core power distribution as a results of a misalignment of a single part-length CEA initially ≥ 112.5 inches withdrawn. Therefore, the magnitude of the power reduction for a part-length CEA initially ≥ 112.5 inches withdrawn is less than that for a full-length CEA. However, the positive reactivity added by the misalignment of a single part-length CEA initially < 112.5 inches withdrawn and the resulting power increase is more significant than the difference in the absorbers and a power reduction is required to return power to ≤ 50% RTP where there is sufficient margin already reserved.

One of the core physics characteristics established by the fuel load pattern is CEA reactivity. CEA reactivity depends on the power being produced in the fuel assembly into which the CEA is inserted. Analysis of a single group 6 CEA misalignment need only be considered with the power being produced in the fuel assemblies into which a group 6 CEA could be inserted. For all other full-length CEAs, the most adverse conditions must be considered. Due to the physical location of group 6, it is unlikely that misalignment of a single group 6 CEA will be most limiting; and typically it is not. Therefore, the magnitude of the power reduction for a group 6 CEA is less than that for the limiting full-length non-group 6 CEA.

A maximum of 120 minutes is allotted to concurrently reduce power and/or eliminate the misalignment. The 120 minute limit is based solely on the duration evaluated in the applicable analyses. Since there is no safety analysis basis provided beyond the 120 minute limit, Technical Specification 3.1.5 requires that the plant be placed in Mode 3 within 6 hours after reaching the 120 minute limit. However, during the power reduction to achieve Mode 3 conditions, continued efforts to re-align the affected CEA are acceptable and recommended.

At all times throughout a required power reduction, THERMAL POWER shall be reduced by greater than or equal to the amount specified by the appropriate figure for the given time following the CEA deviation.

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LCS 3.1.105 CEA Misalignment Power Reduction

Bases

The analysis performed to determine the figures contains the following basic assumptions:

1. Only one CEA is misaligned;

2. The magnitude of the required power reduction is determined from the increase in the integrated radial peaking factor(F_r), represented by static and dynamic distortion factors, the Power Operating Limit (POL)-to-F_r ratio and the thermal margin reserved in COLSS as a function of power level;

3. The increase in F_r is evaluated for only 120 minutes;

4. The thermal margin increase accompanying the decrease in core inlet temperature is used to compensate for the thermal margin decrease accompanying the decrease in RCS pressure;

5. The change in the axial power distribution due to the misalignment of a single CEA has been considered, when applicable, in the power reduction curves;

6. Core power is assumed to remain at its initial value for the full-length CEA and the part-length CEA initially ≥ 112.5 inches withdrawn analyses. No credit is taken for the decrease in the power level due to the negative reactivity added as a result of an inward deviation, and

7. The increase in core power for the part-length CEA initially < 112.5 inches withdrawn analysis is explicitly considered.

3.2 POWER DISTRIBUTION LIMITS

LCS 3.2.100 Linear Heat Rate (LHR)

LHR shall not exceed 13.0 kW/ft.

VALIDITY STATEMENT: Effective upon TSIP implementation.

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	Refer to LCO 3.2.1	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Refer to LCO 3.2.1	

LCS 3.2.100 Linear Heat Rate (LHR)

BASES

The COLR limitation on LHR ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F. Actions and Surveillance Requirements are provided by the Technical Specifications (TS).

Either of the two core power distribution monitoring systems, the Core Operating Limit Supervisory system (COLSS) or the Local Power Density channels in the Core Protection Calculators (CPCs), provide adequate monitoring of the core power distribution and are capable of verifying that the LHR does not exceed its limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating a core power operating limit corresponding to the allowable peak linear heat rate. With the reactor operating at or below this calculated power level the LHR limit is not exceeded.

The COLSS calculated core power and the COLSS calculated core power operating limits based on LHR are continuously monitored and displayed to the operator. A COLSS alarm is annunciated in the event that the core power exceeds the core power operating limit. This provides adequate margin to the LHR operating limit for normal steady state operation. Normal reactor power transients or equipment failures which do not require a reactor trip may result in this core power operating limit being exceeded. In the event this occurs, COLSS alarms will be annunciated. If the event which causes the COLSS limit to be exceeded results in conditions which approach the core safety limits, a reactor trip will be initiated by the Reactor Protective Instrumentation. The COLSS calculation of the LHR includes appropriate penalty factors which provide, with a 95/95 probability/ confidence level, that the maximum LHR calculated by COLSS is conservative with respect to the actual maximum LHR existing in the core. These penalty factors are determined from the uncertainties associated with planar radial peaking measurement, engineering design factors, axial densification, software algorithm modelling, computer processing, rod bow and core power measurement.

The core power distribution and a corresponding power operating limit based on LHR are more accurately determined by the COLSS using the incore detector system. The CPCs determine LHR less accurately with the excore detectors. Therefore, when COLSS is not available the TS LCOs are more restrictive due to the uncertainty of the CPCs. However, when COLSS initially becomes inoperable, the added margin associated with CPC uncertainty is not immediately required and a 4 hour Action is provided for appropriate corrective action.

Parameters required to maintain the operating limit power level based on LHR, margin to DNB and total core power are also monitored by the CPCs assuming minimum core power of 20% RATED THERMAL POWER. The 20% Rated Thermal Power

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BASES (continued)

threshold is due to the neutron flux detector system being inaccurate below 20% core power. Core noise level at low power is too large to obtain usable detector readings. Therefore, in the event that the COLSS is not being used, operation within the DNBR limits with COLSS out of service can be maintained by utilizing a predetermined local power density margin and a total core power limit in the CPC trip channels. The above listed uncertainty penalty factors plus those associated with startup test acceptance criteria are also included in the CPCs.

While operating with the COLSS out of service, the CPC calculated LHR is monitored every 15 minutes to identify any adverse trend in thermal margin. The increased monitoring of LHR during the 4 hour action period ensures that adequate safety margin is maintained for anticipated operational occurrences and no postulated accident results in consequences more severe than those described in Chapter 15 of the UFSAR.

3.2 POWER DISTRIBUTION LIMITS

LCS 3.2.101 The Departure from Nucleate Boiling Ratio (DNBR) shall be maintained by one of the following methods:

a. Maintaining Core Operating Limit Supervisory System (COLSS) calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR (when COLSS is in service, and either one or both control element assembly calculators (CEACs) are OPERABLE);

b. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by 13.0% RTP (when COLSS is in service and neither CEAC is OPERABLE);

c. Operating within limits as specified in Figure 3.2.101-1A for initial power ≥ 90% RTP or Figure 3.2.101-1B for initial power < 90% RTP using any OPERABLE core protection calculator (CPC) channel (when COLSS is out of service and either one or both CEACs are OPERABLE); or

d. Operating within limits as specified in Figure 3.2.101-2 using any OPERABLE CPC channel (when COLSS is out of service and neither CEAC is OPERABLE).

VALIDITY STATEMENT: Effective upon TSIP implementation.

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	Refer to LCO 3.2.4	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Refer to LCO 3.2.4	

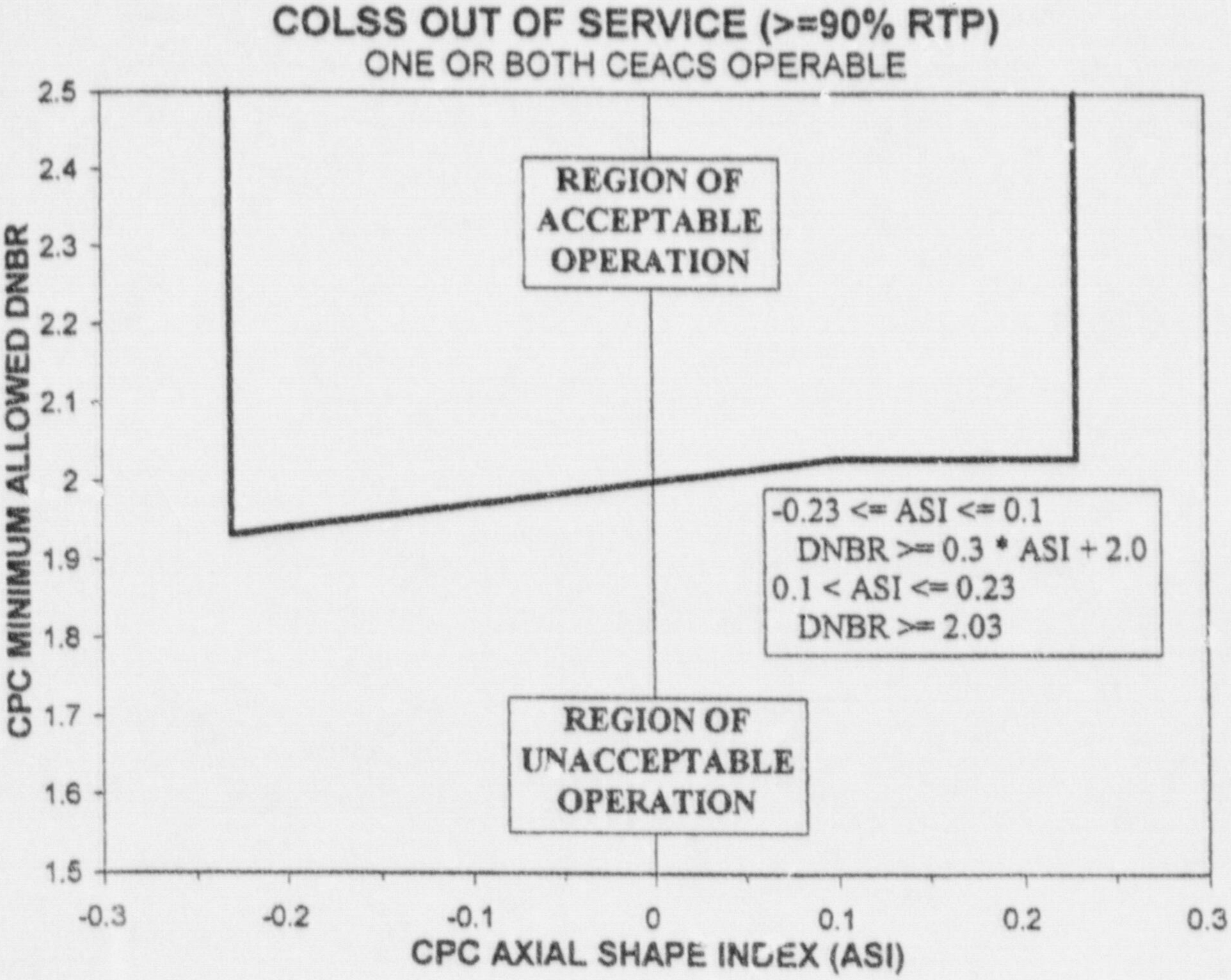

Figure 3.2.101-1A DNBR OPERATING LIMIT BASED ON CORE PROTECTION CALCULATORS
- COLSS OUT OF SERVICE
- ONE OR BOTH CEACS OPERABLE

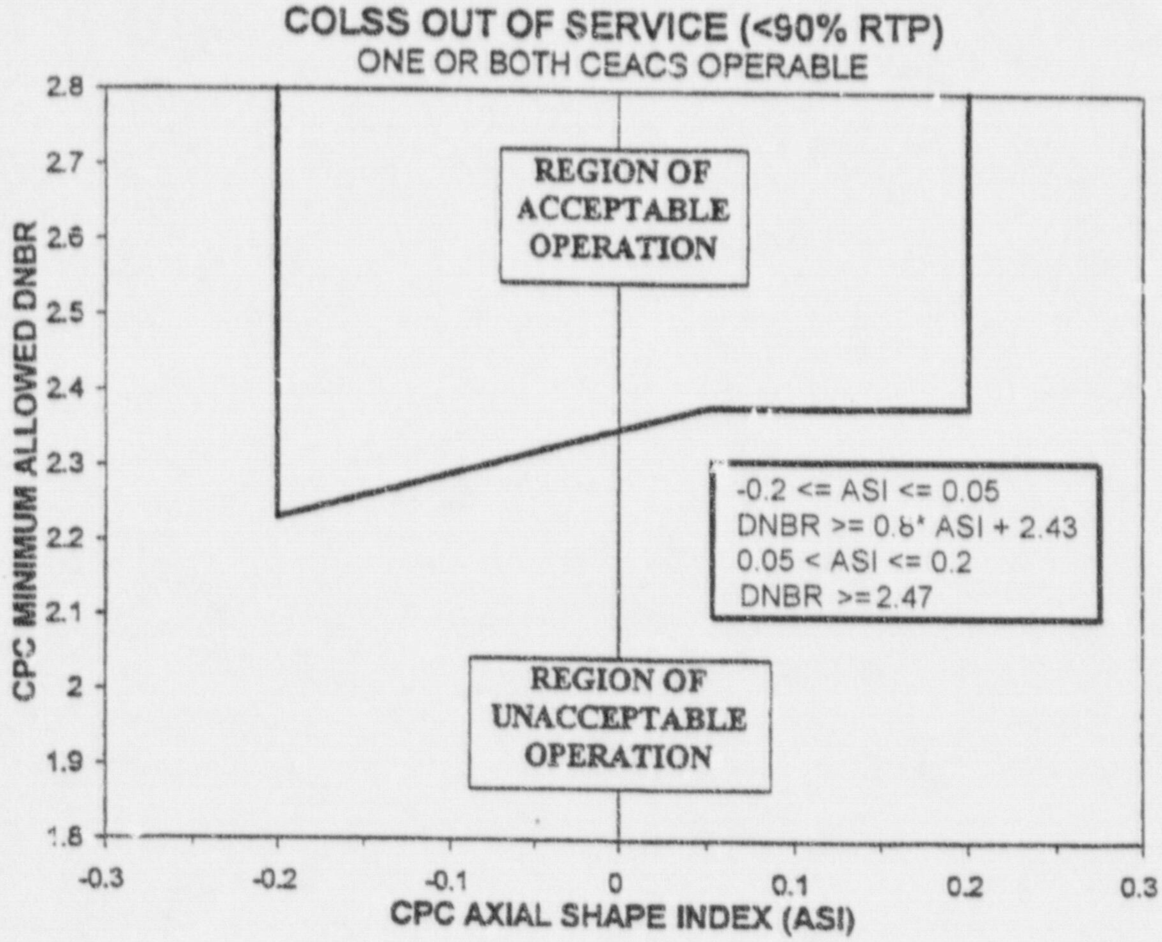

Figure 3.2.101-1B DNBR OPERATING LIMIT BASED ON CORE PROTECTION CALCULATOR
- COLSS OUT OF SERVICE
- BOTH CEACS INOPERABLE

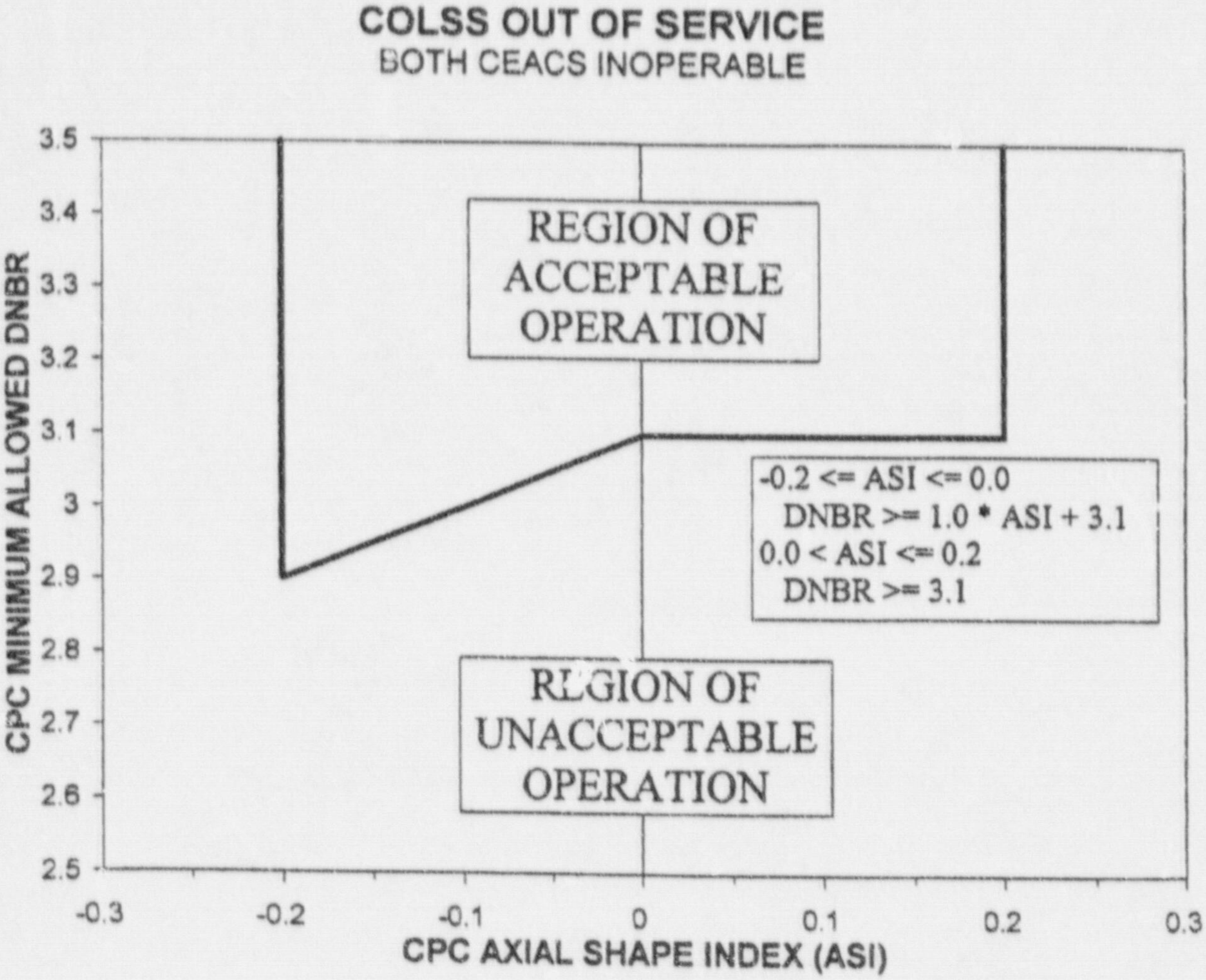

Figure 3.2.101-2 DNBR OPERATING LIMIT BASED ON CORE PROTECTION CALCULATOR
- COLSS OUT OF SERVICE
- BOTH CEACS INOPERABLE

LCS 3.2.101 DNBR

BASES

The COLR limitation on DNBR as a function of Axial Shape Index (ASI) represents a conservative envelope of operating conditions consistent with the safety analysis assumptions and which have been analytically demonstrated adequate to maintain an acceptable minimum DNBR throughout all anticipated operational occurrences, of which the loss of flow transient is the most limiting. Operation of the core with a DNBR at or above this limit provides assurance that an acceptable minimum DNBR will be maintained in the event of a loss of flow transient. The TS provides the required Actions and Surveillance Requirements to ensure that the minimum DNBR is maintained.

Either of the two core power distribution monitoring systems, the Core Operating Limit Supervisory System (COLSS) or the DNBR channels in the Core Protection Calculators (CPCs), provide adequate monitoring of the core power distribution and are capable of verifying that the DNBR does not violate COLR specified limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating a core operating power limit corresponding to the allowable minimum DNBR. The COLSS calculation of core power operating limit based on the minimum DNBR limit includes appropriate penalty factors which provide, with a 95/95 probability/confidence level, that the core power limit calculated by COLSS (based on the minimum DNBR limit) is conservative with respect to the actual core power limit. These penalty factors are determined from the uncertainties associated with planar radial peaking measurement, engineering design factors, state parameter measurement, software algorithm modeling, computer processing, rod bow and core power measurement.

Parameters required to maintain the margin to DNB and total core power are also monitored by the CPCs. In the event that the COLSS is not being used, the DNBR margin can be maintained by monitoring with any OPERABLE CPC channel so that the DNBR remains above the predetermined limit as a function of Axial Shape Index. The above listed uncertainty penalty factors are also included in the CPCs, which assume a minimum of 20% of RATED THERMAL POWER. For the condition in which one or both CEACs are operable, the thermal margin requirements are given as a function of power level. One requirement applies to ≥ 90 % RTP and the other applies to < 90% RTP. The 20% RATED THERMAL POWER threshold is due to the excore neutron flux detector system being less accurate below 20% core power. Core noise level at low power is too large to obtain usable detector readings. The additional CPC uncertainty terms for transient protection are removed from the COLR figures since the curves are intended to monitor the LCO only during steady state operation.

The core power distribution and a corresponding POL based on DNBR are more accurately determined by the COLSS using the incore detector system. The CPCs

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BASES (continued)

determine DNBR less accurately using the excore detectors. When COLSS is not available the TS LCOs are more restrictive due to the uncertainty of the CPCs. However, when COLSS initially becomes inoperable the added margin associated with CPC uncertainty is not immediately required and a 4 hour ACTION is provided for appropriate corrective action.

A DNBR penalty factor has been included in the COLSS and CPC DNBR calculation to accommodate the effects of rod bow. The amount of rod bow in each assembly is dependent upon the average burnup experienced by that assembly. Fuel assemblies that incur higher average burnup will experience a greater magnitude of rod bow. Conversely, lower burnup assemblies will experience less rod bow. In design calculations, the penalty for each batch required to compensate for rod bow is determined from a batch's maximum average assembly burnup applied to the batch's maximum integrated planar-radial power peak. A single net penalty for COLSS and CPC is then determined from the penalties associated with each batch, accounting for the offsetting margins due to the lower radial power peaks in the higher burnup batches.

While operating with the COLSS out of service, the CPC calculated DNBR is monitored every 15 minutes to identify any adverse trend in thermal margin. The increased monitoring of DNBR during the 4 hour action period ensures that adequate safety margin is maintained for anticipated operational occurrences and no postulated accident results in consequences more severe than those described in chapter 15 of the UFSAR.

3.2 POWER DISTRIBUTION LIMITS

LCS 3.2.102 Core average Axial Shape Index (ASI) shall be within the following limits:

a. COLSS OPERABLE $-0.27 \leq \text{ASI} \leq +0.27$

b. COLSS OUT OF SERVICE

(1) One or Both CEACs Operable and $\geq$ 90% RTP $-0.23 \leq \text{ASI} \leq +0.23$

(2) One or Both CEACs Operable and < 90% RTP

OR

Both CEACs Inoperable $-0.20 \leq \text{ASI} \leq +0.20$

VALIDITY STATEMENT: Effective upon TSIP implementation.

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	Refer to LCO 3.2.5	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Refer to LCO 3.2.5	

LCS 3.2.102 ASI

BASES

The Axial Shape Index (ASI) is a measure of the power generated in the lower half of the core less the power generated in the upper half of the core divided by the sum of these powers. This specification is provided to ensure that the core average ASI is maintained within the range of values assumed as an initial condition in the safety analyses.

The ASI can be determined by utilizing either the Core Operating Limit Supervisory System (COLSS) or any OPERABLE Core Protection Calculator (CPC) channel. The real time monitoring capability and accuracy of COLSS allows COLSS to monitor power limit margins closely. Consequently, the ASI limit is broader than it would be with the same core without COLSS. Although the uncertainty associated with the ASI calculated by the CPCs is not dependent on the operability status of the CEACs, a larger uncertainty is applied to the < 90% RTP case with one or both CEACs operable and to the case of both CEACs inoperable to provide additional conservatism. The COLSS continuously calculates the ASI and compares the calculated value to the parameter established for the COLSS ASI alarm limit. In addition, there is an uncertainty associated with the COLSS calculated ASI; therefore the COLSS ASI alarm limit includes this uncertainty. If the LCO is exceeded, COLSS alarms are initiated. The ASI limit is selected so that no safety limit will be exceeded as a result of an anticipated operational occurrence, and so that the consequence of a design basis accident will be acceptable.

3.9 REFUELING OPERATIONS

LCS 3.9.100 Boron Concentration Limit

With the reactor vessel head closure bolts less than fully tensioned or with the head removed, the boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive cf following reactivity conditions is met.

a. $K_{eff} \leq 0.95$, or

b. Boron concentration $\geq$ 2600 ppm.

VALIDITY STATEMENT: Rev. 1 effective 12/1/97, to be implemented within 30 days.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The more restrictive of the following not met: a. $K_{eff} \leq 0.95$, or b. Boron concentration $\geq$ 2600 ppm.	A.1 Suspend all operations involving CORE ALTERATIONS or positive reactivity changes.	Immediately
	<u>AND</u>	
	A.2 Initiate and continue boration at $\geq$ 40 gpm of a solution containing adequate boron concentration until K_{eff} is reduced to $\leq$ 0.95.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.100.1	The boron concentration of the Reactor Coolant System and the refueling canal shall be determined by chemical analysis.	72 hours

LCS 3.9.100 Boron Concentration Limit

BASES

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses. The value of 0.95 or less for K_{eff} includes a conservative allowance for uncertainties.