St. Lucie Unit 2
Docket No. 50-389
Proposed License Amendment
Core Operating Limits Report (COLR)

ATTACHMENT 3 to L-97-280

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DEFINITIONS

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SECTION PAGE

1.0 DEFINITIONS

INDEX

ADMINISTRATIVE CONTROLS

RE-NUMBER AS APPROPRIATE

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LIST OF FIGURES

REPLACE DELETED

CHANNEL FUNCTIONAL TEST

1.6 A CHANNEL FUNCTIONAL TEST shall be the injection of a simulated signal into the channel as close to the primary sensor as practicable to verify OPERABILITY including alarm and/or trip functions.

CONTAINMENT VESSEL INTEGRITY

1.7 CONTAINMENT VESSEL INTEGRITY shall exist when:

a. All containment vessel penetrations required to be closed during accident conditions are either:

  1. Capable of being closed by an OPERABLE containment automatic isolation valve system, or

  2. Closed by manual valves, blind flanges, or deactivated automatic valves secured in their closed positions, except for valves that are open on an intermittent basis under administrative control.

b. All containment vessel equipment hatches are closed and sealed,

c. Each containment vessel air lock is in compliance with the requirements of Specification 3.6.1.3,

d. The containment leakage rates are within the limits of Specification 3.6.1.2, and

e. The sealing mechanism associated with each penetration (e.g., welds, bellows or O-rings) is OPERABLE.

CONTROLLED LEAKAGE

1.8 CONTROLLED LEAKAGE shall be the seal water flow supplied from the reactor coolant pump seals.

CORE ALTERATION

1.9 CORE ALTERATION shall be the movement or manipulation of any fuel, sources, reactivity control components, or other components affecting reactivity within the reactor vessel with the vessel head removed and fuel in the vessel. Exceptions to the above include shared (4 fingered) control element assemblies (CEAs) withdrawn into the upper guide structure (UGS) or evolutions performed with the UGS in place such as CEA latching/unlatching or verification of latching/unlatching which do not constitute a CORE ALTERATION. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

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CORE OPERATING LIMITS REPORT (COLR)

1.9a The COLR is the unit-specific document that provides cycle specific parameter limits for the current operating reload cycle. These cycle-specific parameter limits shall be determined for each reload cycle in accordance with Specification 6.9.1.11. Plant operation within these limits is addressed in individual Specifications.

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

maintained within the limits specified in the COLR. The maximum positive limit shall be

insert

3.1.1.4 The moderator temperature coefficient (MTC) shall be:

a. Less positive than +5 pcm/°F at ≤ 70% RATED THERMAL POWER, and insert

b. Less positive than +3 pcm/°F at > 70% RATED THERMAL POWER~~, and~~ . DELETE

~~c. Less negative than -30 pcm/°F at RATED THERMAL POWER.~~ DELETE

APPLICABILITY: MODES 1 and 2*#

ACTION:

With the moderator temperature coefficient outside any one of the above limits, be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.1.4.1 The MTC shall be determined to be within its limits by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits.

4.1.1.4.2 The MTC shall be determined at the following frequencies and THERMAL POWER conditions during each fuel cycle:

a. Prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.

b. At any THERMAL POWER, within 7 EFPD after reaching a RATED THERMAL POWER equilibrium boron concentration of 800 ppm.

c. At any THERMAL POWER, within 7 EFPD after reaching a RATED THERMAL POWER equilibrium boron concentration of 300 ppm.

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*With K_{eff} greater than or equal to 1.0.

#See Special Test Exceptions 3.10.2 and 3.10.5.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

CEA POSITION

LIMITING CONDITION FOR OPERATION

3.1.3.1 The CEA Block Circuit and all full-length (shutdown and regulating) CEAs which are inserted in the core, shall be OPERABLE with each CEA of a given group positioned within 7.0 inches (indicated position) of all other CEAs in its group.

APPLICABILITY: MODES 1* and 2*.

ACTION:

a. With one or more full-length CEAs inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in at least HOT STANDBY within 6 hours.

b. With the CEA Block Circuit inoperable, within 6 hours either:

   1. With one CEA position indicator per group inoperable take action per Specification 3.1.3.2, or

   2. With the group overlap and/or sequencing interlocks inoperable maintain CEA groups 1, 2, 3 and 4 fully withdrawn and the CEAs in group 5 to less than 15% insertion and place and maintain CEA drive system in either the "Manual" or "Off" position, or

   3. Be in at least HOT STANDBY.

c. With more than one full-length CEA inoperable or misaligned from any other CEA in its group by more than 15 inches (indicated position), be in at least HOT STANDBY within 6 hours.

d. With one full-length CEA misaligned from any other CEA in its group by more than 15 inches, operation in MODES 1 and 2 may continue, provided that the misaligned CEA is positioned within 15 inches of the other CEAs in its group in accordance with the time constraints shown in Figure 3.1-1a.

insert COLR

---

*See Special Test Exceptions 3.10.2, 3.10.4, and 3.10.5.

ACTION: (Continued)

e. With one full-length CEA misaligned from any other CEA in its group by more than 15 inches beyond the time constraints shown in Figure 3.1-1a, reduce power to ≤ 70% of RATED THERMAL POWER prior to completing ACTION e.1 or e.2.
insert COLR

1. Restore the CEA to OPERABLE status within its specified alignment requirements, or

2. Declare the CEA inoperable and satisfy SHUTDOWN MARGIN requirement of Specification 3.1.1.1. After declaring the CEA inoperable, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6 provided:*

    a) Within 1 hour the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7.0 inches of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits shown on Figure 3.1-2; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation. insert COLR

    b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

Otherwise, be in at least HOT STANDBY within the next 6 hours.

f. With one or more full-length CEA(s) misaligned from any other CEAs in its group by more than 7.0 inches but less than or equal to 15 inches, operation in MODES 1 and 2 may continue, provided that within 1 hour the misaligned CEA(s) is either:

1. Restored to OPERABLE status within its above specified alignment requirements, or

2. Declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. After declaring the CEA inoperable, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6 provided:

    a) Within 1 hour the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7.0 inches of the inoperable CEA while maintaining the allowable CEA sequence and insertion limits shown on Figure 3.1-2; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation. insert COLR

    b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

Otherwise, be in at least HOT STANDBY within the next 6 hours .

g. With one full-length CEA inoperable due to causes other than addressed by ACTION a., above, and inserted beyond the Long Term Steady State Insertion Limits but within its above specified alignment requirements, operation in MODES 1 and 2 may continue pursuant to the requirements of Specification 3.1.3.6.

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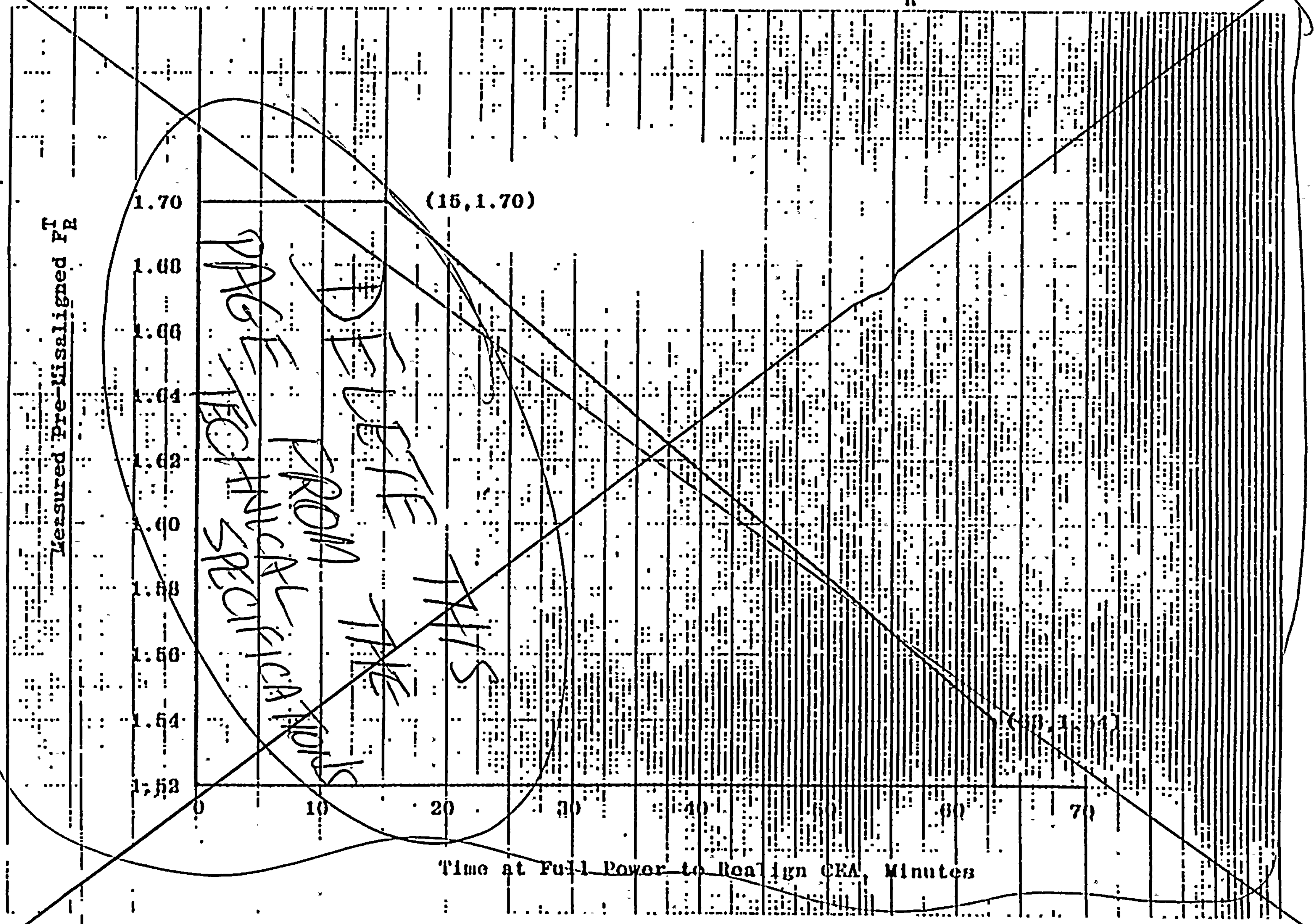
* If the pre-misalignment ASI was more negative than -0.15, reduce power to ≤ 70% of RATED THERMAL POWER or 70% of the THERMAL POWER level prior to the misalignment, whichever is less, prior to completing ACTION e.2.a) and e.2.b).

Figure 3.1-1a

Allowable Time to Realign CEA vs. Initial F_R^T



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ACTION: (Continued)

h. With one full-length CEA inoperable due to causes other than addressed by ACTION a., above, but within its above specified alignment requirements and either fully withdrawn or within the Long Term Steady State Insertion Limits if in full-length CEA group 5, operation in MODES 1 and 2 may continue.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full-length CEA shall be determined to be within 7.0 inches (indicated position) of all other CEAs in its group at least once per 12 hours except during time intervals when the Deviation Circuit and/or CEA Block Circuit are inoperable, then verify the individual CEA positions at least once per 4 hours.

4.1.3.1.2 Each full-length CEA not fully inserted in the core shall be determined to be OPERABLE by movement of at least 7.0 inches in any one direction at least once per 92 days.

4.1.3.1.3 The CEA Block Circuit shall be demonstrated OPERABLE at least once per 92 days by a functional test which verifies that the circuit prevents any CEA from being misaligned from all other CEAs in its group by more than 7.0 inches (indicated position).

4.1.3.1.4 The CEA Block Circuit shall be demonstrated OPERABLE by a functional test which verifies that the circuit maintains the CEA group overlap and sequencing requirements of Specification 3.1.3.6 and that the circuit prevents the regulating CEAs from being inserted beyond the Power Dependent Insertion Limit of Figure 3.1-2: insert COLR

*a. Prior to each entry into MODE 2 from MODE 3, except that such verification need not be performed more often than once per 92 days, and

b. At least once per 6 months.

---

*The licensee shall be excepted from compliance during the initial startup test program for an entry into MODE 2 from MODE 3 made in association with a measurement of power defect.

REGULATING CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The regulating CEA groups shall be limited to the withdrawal sequence and to the insertion limits shown on Figure 3.1-2 (regulating CEAs are considered to be fully withdrawn in accordance with Figure 3.1-2 when withdrawn to greater than or equal to 129.0 inches), with CEA insertion between the Long Term Steady State Insertion Limits and the Power Dependent Insertion Limits restricted to:

insert COLR insert COLR

a. Less than or equal to 4 hours per 24 hour interval,

b. Less than or equal to 5 Effective Full Power Days per 30 Effective Full Power Day interval, and

c. Less than or equal to 14 Effective Full Power Days per calendar year.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

a. With the regulating CEA groups inserted beyond the Power Dependent Insertion Limits, except for surveillance testing pursuant to Specification 4.1.3.1.2, within 2 hours either:

   1. Restore the regulating CEA groups to within the limits, or

   2. Reduce THERMAL POWER to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the CEA group position ~~using the above figure.~~ replace and insertion limits specified in the COLR.

b. With the regulating CEA groups inserted between the Long Term Steady State Insertion Limits and the Power Dependent Insertion Limits for intervals greater than 4 hours per 24 hour interval, operation may proceed provided either:

   1. The Short Term Steady State Insertion Limits ~~of Figure 3.1-2~~ DELETE are not exceeded, or

   2. Any subsequent increase in THERMAL POWER is restricted to less than or equal to 5% of RATED THERMAL POWER per hour.

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*See Special Test Exceptions 3.10.2, 3.10.4, and 3.10.5.

#With K_{eff} greater than or equal to 1.0.

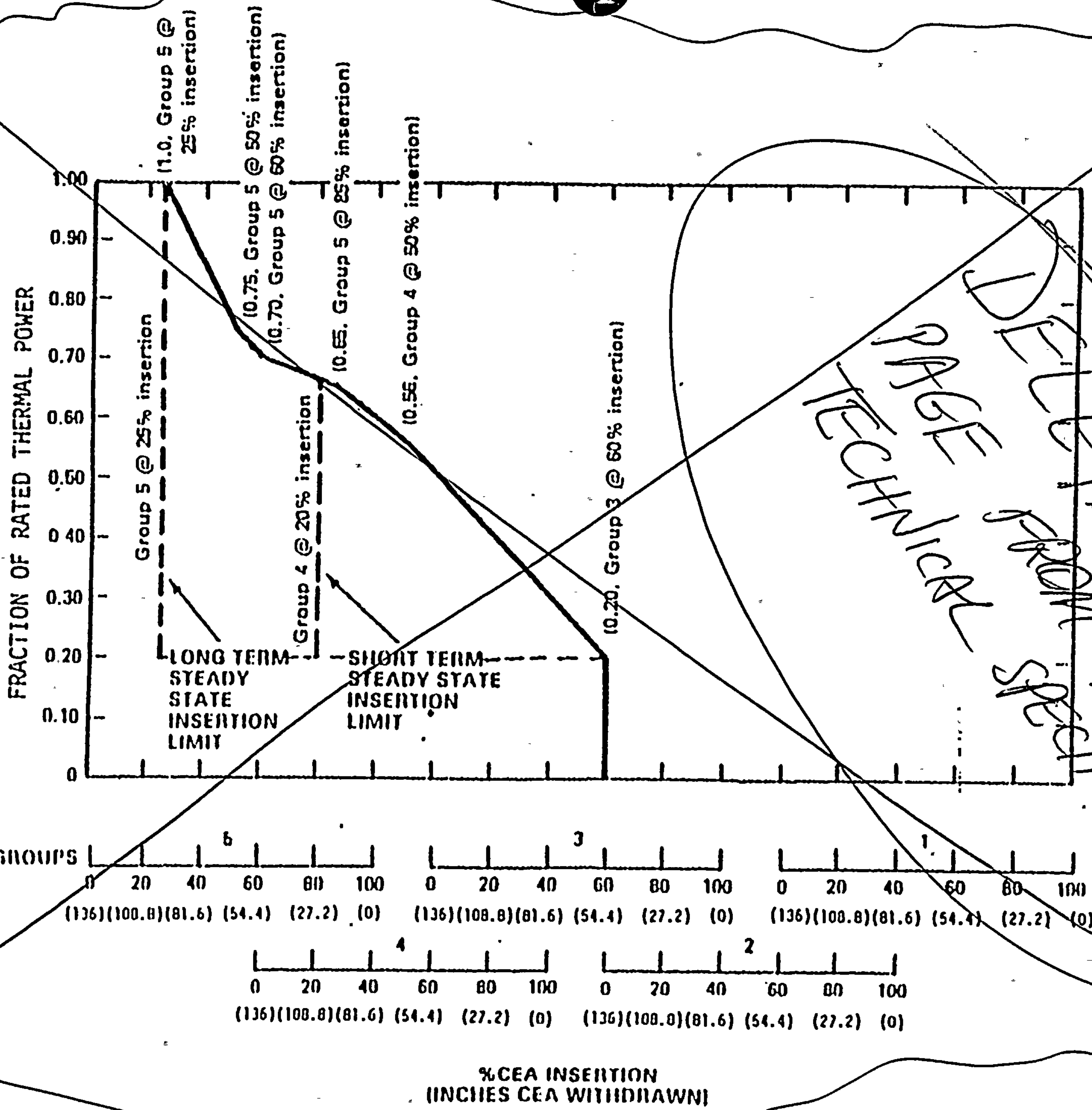

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Figure 3.1.2

3/4.2 POWER DISTRIBUTION LIMITS

3/4 2:1 LINEAR HEAT RATE

LIMITING CONDITION FOR OPERATION

3.2.1 The linear heat rate shall not exceed the limits ~~shown on Figure 3.2-1~~. replace specified in the COLR.

APPLICABILITY: MODE 1.

ACTION:

With the linear heat rate exceeding its limits, as indicated by four or more coincident incore channels or by the AXIAL SHAPE INDEX outside of the power dependent control limits of Figure 3.2-2, within 15 minutes initiate corrective action to reduce the linear heat rate to within the limits and either:

insert COLR

a. Restore the linear heat rate to within its limits within 1 hour, or

b. Be in at least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The provisions of Specification 4.0.4 are not applicable.

4.2.1.2 The linear heat rate shall be determined to be within its limits by continuously monitoring the core power distribution with either the excore detector monitoring system or with the incore detector monitoring system.

4.2.1.3 Excore Detector Monitoring System - The excore detector monitoring system may be used for monitoring the ~~core power distribution~~ by:
replace linear heat rate

a. Verifying at least once per 12 hours that the full-length CEAs are withdrawn to and maintained at or beyond the Long Term Steady State Insertion Limit of Specification 3.1.3.6.

b. Verifying at least once per 31 days that the AXIAL SHAPE INDEX alarm setpoints are adjusted to within the limit shown on Figure 3.2-2.

insert COLR

Amendment No.

c. Verifying that the AXIAL SHAPE INDEX is maintained within the allowable limits of Figure 3.2-2, where 100% of maximum allowable power represents the maximum THERMAL POWER allowed by the following expression:

insert COLR

$M \times N$

where:

1. M is the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination.

2. N is the maximum allowable fraction of RATED THERMAL POWER as determined by the F^T_{xy} curve of Figure 3.2-3.

insert COLR

4.2.1.4 Incore Detector Monitoring System# - The incore detector monitoring system may be used for monitoring the ~~core power distribution~~ by verifying that the incore detector Local Power Density alarms:

replace linear heat rate

a. Are adjusted to satisfy the requirements of the core power distribution map which shall be updated at least once per 31 days of accumulated operation in MODE 1.

b. Have their alarm setpoint adjusted to less than or equal to the limits shown on Figure 3.2-1.

insert COLR

[#] If incore system becomes inoperable, reduce power to M x N within 4 hours and monitor linear heat rate in accordance with Specification 4.2.1.3.

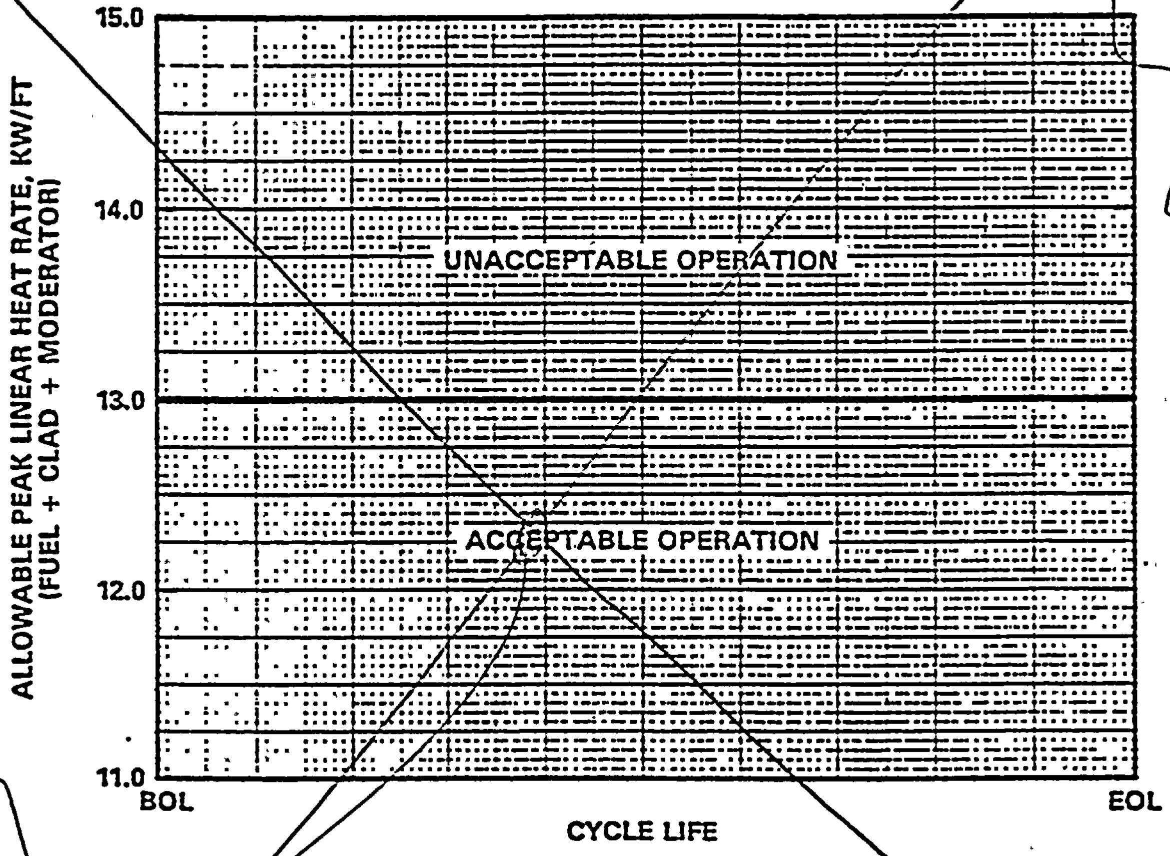

Figure 3.2-1
Allowable peak linear heat rate vs burnup

replace

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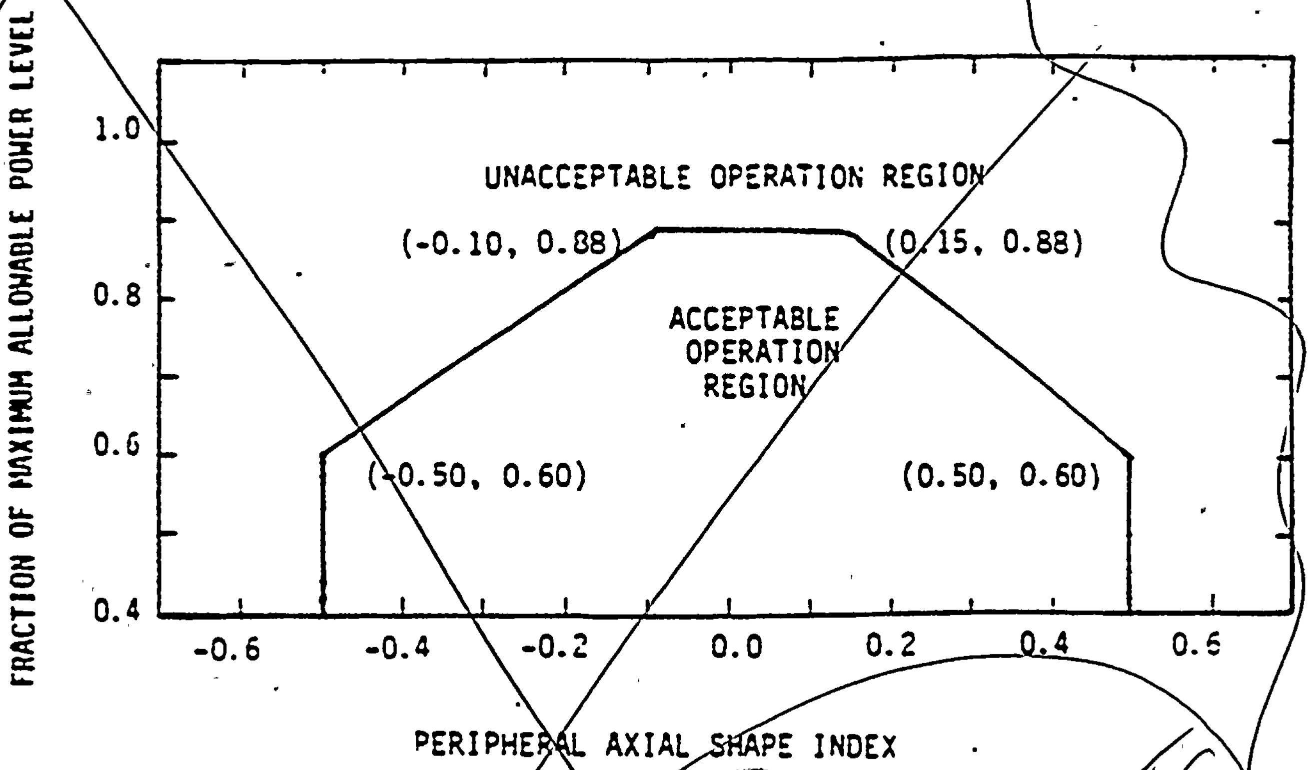

(NOT APPLICABLE BELOW 40% POWER)

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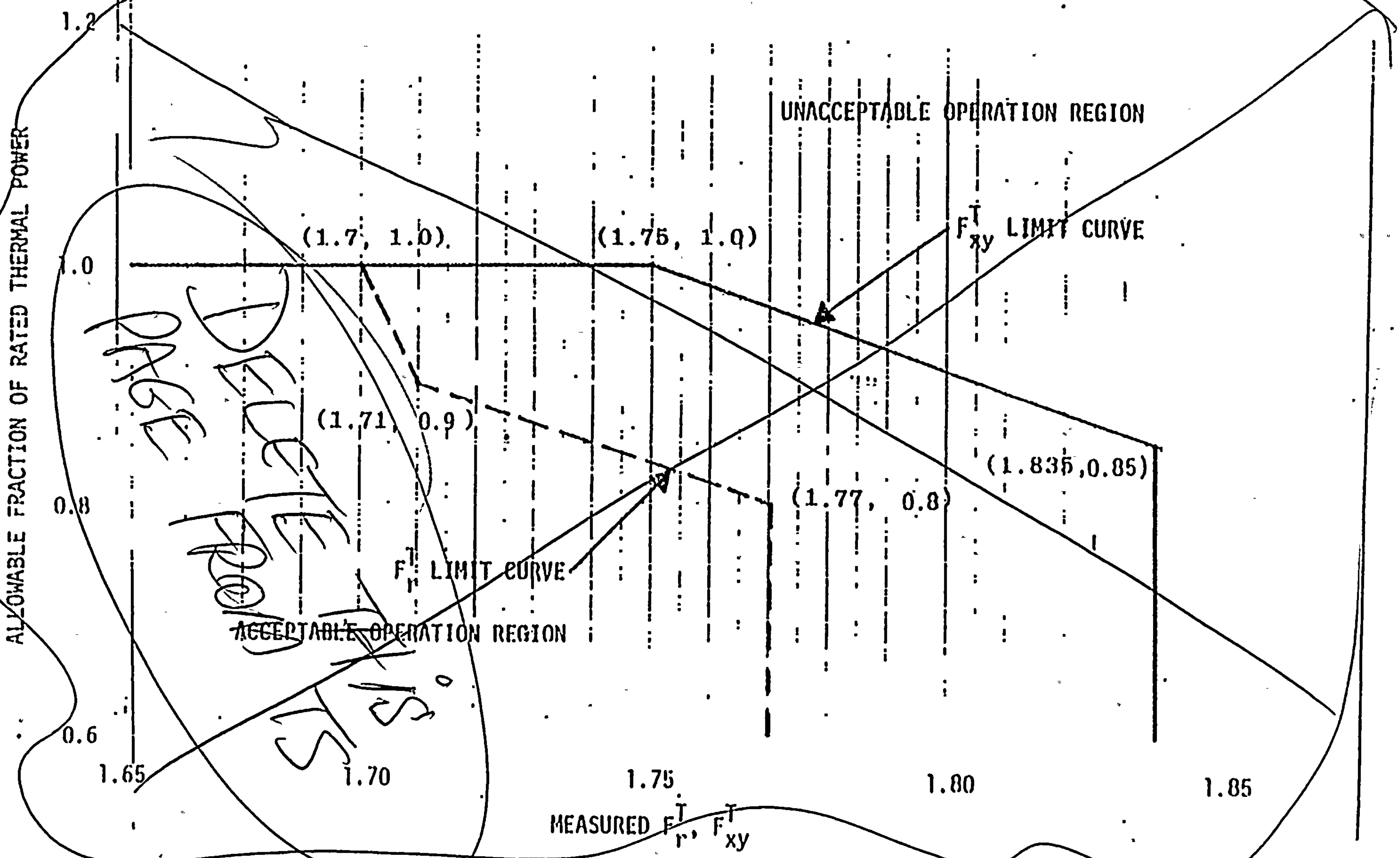
FIGURE 3.2-2

AXIAL SHAPE INDEX VS. FRACTION OF MAXIMUM ALLOWABLE POWER LEVEL PER SPECIFICATION 4.2.1.3

FIGURE [illegible]

ALLOWABLE COMBINATIONS OF THERMAL POWER AND F_r^T, F_{xy}^T



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3/4.2.2 TOTAL PLANAR RADIAL PEAKING FACTORS - F_{xy}^T

LIMITING CONDITION FOR OPERATION

3.2.2 The calculated value of F_{xy}^T shall be ~~limited to ≤ 1.75~~.

replace within the limits specified in the COLR.

APPLICABILITY: MODE 1*.

ACTION:

replace not within limits

With F_{xy}^T ~~> 1.75~~, within 6 hours either:

a. Reduce THERMAL POWER to bring the combination of THERMAL POWER and F_{xy}^T to within the limits of COLR Figure 3.2-3 and withdraw the full length CEAs to or beyond the Long Term Steady State Insertion Limits of Specification 3.1.3.6; or

insert COLR

b. Be in HOT STANDBY.

SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 F_{xy}^T shall be calculated by the expression $F_{xy}^T = F_{xy}(1+T_q)$ when F_{xy} is calculated with a non-full core power distribution analysis code and shall be calculated as $F_{xy}^T = F_{xy}$ when calculations are performed with a full core power distribution analysis code. F_{xy}^T shall be determined to be within its limit at the following intervals:

a. Prior to operation above 70% of RATED THERMAL POWER after each fuel loading,

b. At least once per 31 days of accumulated operation in MODE 1, and

c. Within 4 hours if the AZIMUTHAL POWER TILT (T_q) is > 0.03.

---

*See Special Test Exception 3.10.2.

POWER DISTRIBUTION LIMITS

TOTAL INTEGRATED RADIAL PEAKING FACTOR - F_r^T

LIMITING CONDITION FOR OPERATION

3.2.3 The calculated value of F_r^T shall be ~~limited to ≤ 1.70~~.

replace within the limits specified in the COLR.

APPLICABILITY: MODE 1*.

ACTION: replace not within limits

With F_r^T ~~> 1.70~~, within 6 hours either:

a. Be in at least HOT STANDBY, or

b. Reduce THERMAL POWER to bring the combination of THERMAL POWER and F_r^T to within the limits of Figure 3.2-3 and withdraw the full-length CEAs to or beyond the Long Term Steady State Insertion Limits of Specification 3.1.3.6. The THERMAL POWER limit determined from Figure 3.2-3 shall then be used to establish a revised upper THERMAL POWER level limit on Figure 3.2-4 (truncate Figure 3.2-4 at the allowable fraction of RATED THERMAL POWER determined by Figure 3.2-3) and subsequent operation shall be maintained within the reduced acceptable operation region of Figure 3.2-4.

COLR insert

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insert COLR

insert COLR

SURVEILLANCE REQUIREMENTS

4.2.3.1 The provisions of Specification 4.0.4 are not applicable.

4.2.3.2 F_r^T shall be calculated by the expression $F_r^T = F_r(1+T_q)$ when F_r is calculated with a non-full core power distribution analysis code and shall be calculated as $F_r^T = F_r$ when calculations are performed with a full core power distribution analysis code. F_r^T shall be determined to be within its limit at the following intervals:

a. Prior to operation above 70% of RATED THERMAL POWER after each fuel loading,

b. At least once per 31 days of accumulated operation in MODE 1, and

c. Within 4 hours if the AZIMUTHAL POWER TILT (T_q) is > 0.03.

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*See Special Test Exception 3.10.2.

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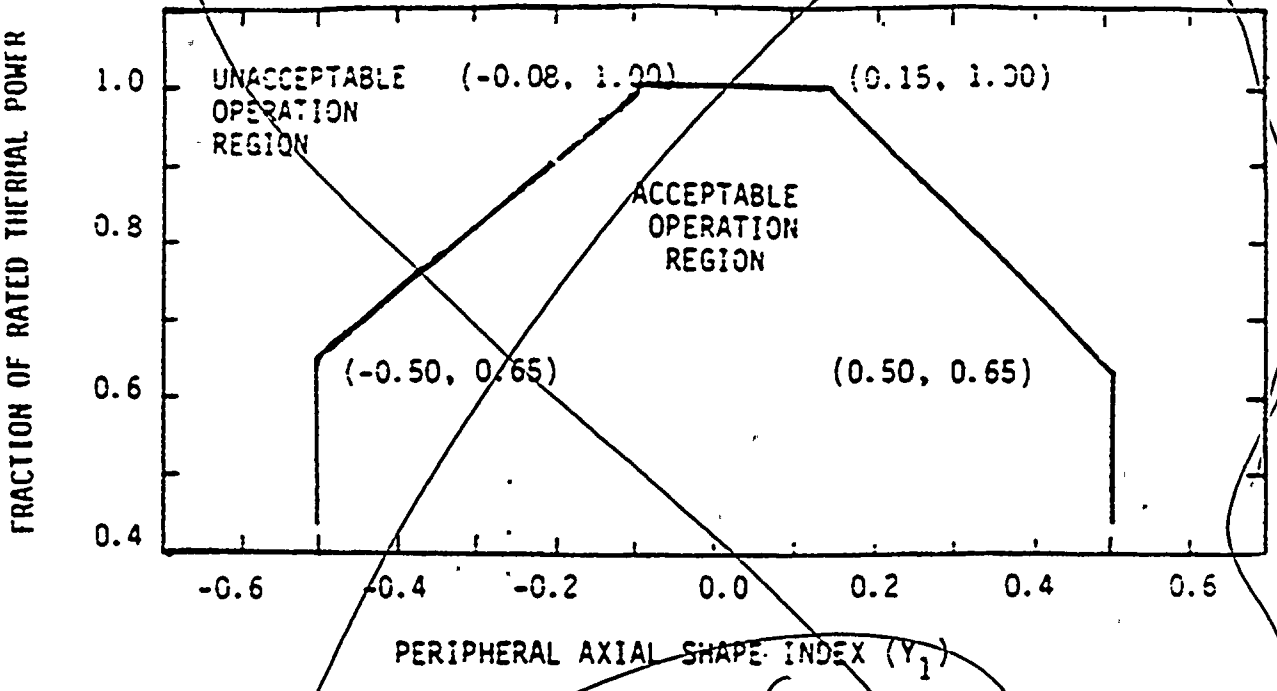
Page 3/4 2-12 (Amendment 42) has been deleted from the Technical Specifications. The next page is 3/4 2-13.



(NOT APPLICABLE BELOW 40% POWER)

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FIGURE 3.2-4

AXIAL SHAPE INDEX OPERATING LIMITS WITH FOUR REACTOR COOLANT PUMPS OPERATING

TABLE 3.2-2

DNB MARGIN

LIMITS	
PARAMETER	FOUR REACTOR COOLANT PUMPS OPERATING
Cold Leg Temperature (Narrow Range)	$535^\circ F^* \leq T \leq 549^\circ F$
Pressurizer Pressure	$2225\ \text{psia}^{**} \leq P_{PZR} \leq 2350\ \text{psia}^*$
Reactor Coolant Flow Rate	$\geq$ 363,000 gpm
AXIAL SHAPE INDEX	^ Figure 3.2-4 insert COLR

---

[*] Applicable only if power level $\geq$ 70% RATED THERMAL POWER.

[**] Limit not applicable during either a THERMAL POWER ramp increase in excess of 5% of RATED THERMAL POWER or a THERMAL POWER step increase of greater than 10% of RATED THERMAL POWER.

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 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 of following reactivity conditions is met:~~ replace within the limit specified in the COLR

DELETE

a. ~~Either a K_{eff} of 0.95 or less, or~~

b. ~~A boron concentration of greater than or equal to 1720 ppm.~~

APPLICABILITY: MODE 6*.

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at greater than or equal to 40 gpm of a solution containing 1720 ppm boron or ~~its equivalent until K_{eff} is reduced to less than or equal to 0.95 or the boron concentration is restored to greater than or equal to 1720 ppm, whichever is the more restrictive~~. replace greater to restore boron concentration to within limits.

SURVEILLANCE REQUIREMENTS

4.9.1.1 ~~The more restrictive of the above two reactivity conditions~~ replace The boron concentration limit shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full length CEA in excess of 3 feet from its fully inserted position within the reactor pressure vessel.

4.9.1.2 The boron concentration of the reactor coolant system and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

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*The reactor shall be maintained in MODE 6 whenever fuel is in the reactor vessel with the reactor vessel head closure bolts less than fully tensioned or with the head removed.

MOVABLE CONTROL ASSEMBLIES (Continued)

Overpower margin is provided to protect the core in the event of a large misalignment (> 15 inches) of a CEA. However, this misalignment would cause distortion of the core power distribution. This distribution may, in turn, have a significant effect on (1) the available SHUTDOWN MARGIN, (2) the time-dependent long-term power distributions relative to those used in generating LCOs and LSSS setpoints, and (3) the ejected CEA worth used in the safety analysis. Therefore, the ACTION statement associated with the large misalignment of a CEA requires a prompt realignment of the misaligned CEA.

The ACTION statements applicable to misaligned or inoperable CEAs include requirements to align the OPERABLE CEAs in a given group with the inoperable CEA. Conformance with these alignment requirements bring the core, within a short period of time, to a configuration consistent with that assumed in generating LCO and LSSS setpoints. However, extended operation with CEAs significantly inserted in the core may lead to perturbations in (1) local burnup, (2) peaking factors, and (3) available shutdown margin which are more adverse than the conditions assumed to exist in the safety analyses and LCO and LSSS setpoints determination. Therefore, time limits have been imposed on operation with inoperable CEAs to preclude such adverse conditions from developing.

The requirement to reduce power in certain time limits depending upon the previous F_r^T is to eliminate a potential nonconservatism for situations when a CEA has been declared inoperable. A worst-case analysis has shown that a DNBR SAFDL violation may occur during the second hour after the CEA misalignment if this requirement is not met. This potential DNBR SAFDL violation is eliminated by limiting the time operation is permitted at full power before power reductions are required. These reductions will be necessary once the deviated CEA has been declared inoperable. This time allowed for continued operation at a reduced power level can be permitted for the following reasons:

the limits of Specification 3.2.3

the limits of Specification 3.2.3

1. The margin calculations which support the Technical Specifications are based on a steady-state radial peak of F_r^T = ~~1.70~~. replace
2. replace When the actual F_r^T < ~~1.70~~, significant additional margin exists.
3. This additional margin can be credited to offset the increase in F_r^T with time that can occur following a CEA misalignment.
4. This increase in F_r^T is caused by xenon redistribution.
5. The present analysis can support allowing a misalignment to exist ~~for~~ delete ~~up to 63 minutes~~ without correction, if the ~~initial $F_r^T \leq 1.54$~~.

DELETE

time constraints and initial F_r^T limits of COLR Figure 3.1.1a are met. replace

3/4.2.1 LINEAR HEAT RATE

The limitation on linear heat rate ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F.

Either of the two core power distribution monitoring systems, the Excore Detector Monitoring System and the Incore Detector Monitoring System, provides adequate monitoring of the core power distribution and are capable of verifying that the linear heat rate does not exceed its limits. The Excore Detector Monitoring System performs this function by continuously monitoring the AXIAL SHAPE INDEX with the OPERABLE quadrant symmetric excore neutron flux detectors insert COLR and verifying that the AXIAL SHAPE INDEX is maintained within the allowable limits of Figure 3.2-2. In conjunction with the use of the excore monitoring system and in establishing the AXIAL SHAPE INDEX limits, the following assumptions are made: (1) the CEA insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are satisfied, (2) the AZIMUTHAL POWER TILT restrictions of Specification 3.2.4 are satisfied, and (3) the TOTAL PLANAR RADIAL PEAKING FACTOR does not exceed the limits of Specification 3.2.2.

The Incore Detector Monitoring System continuously provides a direct measure of the peaking factors and the alarms which have been established for the individual incore detector segments insert COLR ensure that the peak linear heat rates will be maintained within the allowable limits of Figure 3.2-1. The setpoints for these alarms include allowances, set in the conservative directions, for (1) a measurement-calculational uncertainty factor, (2) an engineering uncertainty factor, (3) an allowance for axial fuel densification and thermal expansion, and (4) a THERMAL POWER measurement uncertainty factor.

3/4.2.2, 3/4.2.3 and 3/4.2.4 TOTAL PLANAR AND INTEGRATED RADIAL PEAKING FACTORS - F^T_{xy} and F^T_r AND AZIMUTHAL POWER TILT - T_q

The limitations on F^T_{xy} and T_q are provided to ensure that the assumptions used in the analysis for establishing the Linear Heat Rate and Local Power Density - High LCOs and LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. The limitations on F^T_r and T_q are provided to ensure that the assumptions used in the analysis establishing the DNB Margin LCO, the Thermal Margin/Low Pressure LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. If F^T_{xy}, F^T_r or T_q exceed their basic limitations, operation may continue under the additional restrictions imposed by the ACTION statements since these additional restrictions provide adequate provisions to assure that the

3/4.9.1 BORON CONCENTRATION

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 safety analyses. The value ~~of 0.95 or less~~ for K_{eff} includes a 1% delta k/k conservative allowance for uncertainties. Similarly, the boron concentration value ~~of 1720 ppm or greater also~~ includes a conservative uncertainty allowance of 50 ppm boron.

replace specified in the COLR

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the startup neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor pressure vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short lived fission products. This decay time is consistent with the assumptions used in the safety analyses.

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential while in the REFUELING MODE.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity condition during CORE ALTERATIONS.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT (Continued)

6.9.1.9 At least once every 5 years, an estimate of the actual population within 10 miles of the plant shall be prepared and submitted to the NRC.

6.9.1.10 At least once every 10 years, an estimate of the actual population within 50 miles of the plant shall be prepared and submitted to the NRC.

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SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the NRC within the time period specified for each report.

6.10 RECORD RETENTION

In addition to the applicable record retention requirements of Title 10, Code of Federal Regulations, the following records shall be retained for at least the minimum period indicated.

6.10.1 The following records shall be retained for at least 5 years:

a. Records and logs of unit operation covering time interval at each power level.

b. Records and logs of principal maintenance activities, inspections, repair and replacement of principal items of equipment related to nuclear safety.

c. All REPORTABLE EVENTS.

d. Records of surveillance activities; inspections and calibrations required by these Technical Specifications.

e. Records of changes made to the procedures required by Specification 6.8.1.

St. Lucie Unit 2
Docket No. 50-389
Proposed License Amendment
Core Operating Limits Report (COLR)

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6.9.1.11 CORE OPERATING LIMITS REPORT (COLR)

a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

Specification 3.1.1.4	Moderator Temperature Coefficient
Specification 3.1.3.1	Movable Control Assemblies - CEA Position
Specification 3.1.3.6	Regulating CEA Insertion Limits
Specification 3.2.1	Linear Heat Rate
Specification 3.2.2	Total Planar Radial Peaking Factors - F_{xy}^T
Specification 3.2.3	Total Integrated Radial Peaking Factor - F_r^T
Specification 3.2.5	DNB Parameters - Axial Shape Index
Specification 3.9.1	Refueling Operations - Boron Concentration

b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, as described in the following documents or any approved Revisions and Supplements thereto:

1: WCAP-11596-P-A, "Qualification of the PHOENIX-P/ANC Nuclear Design System for Pressurized Water Reactor Cores," June 1988 (Westinghouse Proprietary)

2. NF-TR-95-01, "Nuclear Physics Methodology for Reload Design of Turkey Point & St. Lucie Nuclear Plants," Florida Power & Light Company, January 1995.

3. CENPD-199-P, Rev. 1-P-A, "C-E Setpoint Methodology: CE Local Power Density and DNB LSSS and LCO Setpoint Methodology for Analog Protection Systems," January 1986.

4. CENPD-266-P-A, "The ROCS and DIT Computer Code for Nuclear Design," April 1983.

5. CENPD-275-P-A, "C-E Methodology for Core Designs Containing Gadolinia-Urania Burnable Absorbers," May 1988.

6. CENPD-188-A, "HERMITE: A Multi-Dimensional Space - Time Kinetics Code for PWR Transients," July 1976.

7. CENPD-153-P, Rev. 1-P-A, "Evaluation of Uncertainty in the Nuclear Power Peaking Measured by the Self-Powered, Fixed Incore Detector System," May 1980.

8. CEN-123(F)-P, "Statistical Combination of Uncertainties Methodology Part 1: C-E Calculated Local Power Density and Thermal Margin/Low Pressure LSSS for Calvert Cliffs Units I and II," December 1979.

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9. CEN-123(F)-P, "Statistical Combination of Uncertainties Methodology Part 2: Combination of System Parameter Uncertainties in Thermal Margin Analyses for Calvert Cliffs Units 1 and 2," January 1980.

10. CEN-123(F)-P, "Statistical Combination of Uncertainties Methodology Part 3: C-E Calculated Departure from Nucleate Boiling and Linear Heat Rate Limiting Conditions for Operation for Calvert Cliffs Units 1 and 2," February 1980.

11. CEN-191(B)-P, "CETOP-D Code Structure and Modeling Methods for Calvert Cliffs Units 1 and 2," December 1981.

12. Letter, J. W. Miller (NRC) to J. R. Williams, Jr. (FPL), Docket No. 50-389, Regarding Unit 2 Cycle 2 License Approval (Amendment No. 8 to NPF-16 and SER), November 9, 1984 (Approval of CEN-123(F)-P (three parts) and CEN-191(B)-P).

13. CEN-371(F)-P, "Extended Statistical Combination of Uncertainties," July 1989.

14. Letter, J. A. Norris (NRC) to J. H. Goldberg (FPL), Docket No. 50-389, "St. Lucie Unit 2 - Change to Technical Specification Bases Sections '2.1.1 Reactor Core' and '3/4.2.5 DNB Parameters' (TAC No. M87722)," March 14, 1994 (Approval of CEN-371(F)-P).

15. CENPD-161-P-A, "TORC Code, A Computer Code for Determining the Thermal Margin of a Reactor Core," April 1986.

16. CENPD-162-P-A, "Critical Heat Flux Correlation for C-E Fuel Assemblies with Standard Spacer Grids Part 1, Uniform Axial Power Distribution," April 1975.

17. CENPD-207-P-A, "Critical Heat Flux Correlation for C-E Fuel Assemblies with Standard Spacer Grids Part 2, Non-uniform Axial Power Distribution," December 1984.

18. CENPD-206-P-A, "TORC Code, Verification and Simplified Modeling Methods," June 1981.

19. CENPD-225-P-A, "Fuel and Poison Rod Bowing," June 1983.

20. CENPD-139-P-A, "C-E Fuel Evaluation Model Topical Report," July 1974.

21. CEN-161(B)-P-A, "Improvements to Fuel Evaluation Model," August 1989.

22. CEN-161(B)-P, Supplement 1-P-A, "Improvements to Fuel Evaluation Model," January 1992.

23. CENPD-132, Supplement 3-P-A, "Calculative Methods for the C-E Large Break LOCA Evaluation Model for the Analysis of C-E and <u>W</u> Designed NSSS," June 1985.

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24. CENPD-133, Supplement 5-A, "CEFLASH-4A, A FORTRAN77 Digital Computer Program for Reactor Blowdown Analysis," June 1985.

25. CENPD-134, Supplement 2-A, "COMPERC-II, a Program for Emergency Refill-Reflood of the Core," June 1985.

26. CENPD-135-P, Supplement 5, "STRIKIN-II, A Cylindrical Geometry Fuel Rod Heat Transfer Program," April 1977.

27. Letter, R. L. Baer (NRC) to A. E. Scherer (CE), "Evaluation of Topical Report CENPD-135, Supplement #5," September 6, 1978.

28. CENPD-137, Supplement 1-P, "Calculative Methods for the C-E Small Break LOCA Evaluation Model," January 1977.

29. CENPD-133, Supplement 3-P, "CEFLASH-4AS, A Computer Program for the Reactor Blowdown Analysis of the Small Break Loss of Coolant Accident," January 1977.

30. Letter, K. Kniel (NRC) to A. E. Scherer (CE), "Evaluation of Topical Reports CENPD-133, Supplement 3-P and CENPD-137, Supplement 1-P," September 27, 1977.

31. CENPD-138, Supplement 2-P, "PARCH, A FORTRAN-IV Digital Program to Evaluate Pool Boiling, Axial Rod and Coolant Heatup," January 1977.

32. Letter, C. Aniel (NRC) to A. E. Scherer (CE), "Evaluation of Topical Report CENPD-138, Supplement 2-P," April 10, 1978.

33. Letter, W. H. Bohlke (FPL) to Document Control Desk (NRC), "St. Lucie Unit 2, Docket No. 50-389, Proposed License Amendment, MTC Change from -27 pcm to -30 pcm," L-91-325, December 17, 1991.

34. Letter, J. A. Norris (NRC) to J. H. Goldberg (FPL), "St. Lucie Unit 2 - Issuance of Amendment Re: Moderator Temperature Coefficient (TAC No. M82517)," July 15, 1992.

35. Letter, J. W. Williams, Jr. (FPL) to D. G. Eisenhut (NRC), "St. Lucie Unit No. 2, Docket No. 50-389, Proposed License Amendment, Cycle 2 Reload," L-84-148, June 4, 1984.

36. Letter, J. R. Miller (NRC) to J. W. Williams, Jr. (FPL), Docket No. 50-389, Regarding Unit 2 Cycle 2 License Approval (Amendment No. 8 to NPF-16 and SER), November 9, 1984 (Approval of Methodology contained in L-84-148).

37. Letter, A. E. Scherer Enclosure 1-P to LD-82-001, "CESEC-Digital Simulation of a Combustion Engineering Nuclear Steam Supply System," December 1981.

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38. Safety Evaluation Report, "CESEC Digital Simulation of a Combustion Engineering Steam Supply System (TAC No.: 01142)," October 27, 1983.

39. CENPD-282-P-A, Volumes 1, 2, and 3, Supplement 1-P, "Technical Manual for the CENTS Code," March 1994.

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SHUTDOWN MARGIN, transient analysis limits, and accident analysis limits) of the safety analysis are met.

d. The COLR, including any mid cycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.