

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

FULL LENGTH CEA POSITION

LIMITING CONDITION FOR OPERATION

3.1.3.1 The CEA Block Circuit and all full length (shutdown and regulating) CEAs shall be OPERABLE with each CEA of a given group positioned within 7.5 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 HOT STANDBY within 6 hours.
- b. With the CEA Block Circuit inoperable, within 6 hours either:
 - ~~1. Restore the CEA Block Circuit to OPERABLE status, or~~
 1. With one CEA position indicator per group inoperable take action, per Specification 3.1.3.3, or
 - ~~2. Fully withdraw all CEAs in groups 3, 4, 5 and 6 and~~
 2. With the group overlap and/or SEQUENCING INTERLOCKS inoperable, maintain CEAs in groups 3, 4, 5 and 6 fully withdrawn and withdraw the CEAs in group 7 to less than 5% insertion and place and maintain the CEA drive system mode switch in either the "Manual" or "Off" position, or
 3. Be in at least HOT STANDBY.
- ~~c. With one full length CEA inoperable (unless immovable as a result of excessive friction or mechanical interference or known to be untrippable) but within its above specified alignment requirements, operation in MODES 1 and 2 may continue for up to 7 days per occurrence with a total accumulated time of 14 days per calendar year.~~
- c. With one full length CEA inoperable due to causes other than addressed by Action 2., above, but within its above specified alignment requirements and either fully withdrawn or within the LONG TERM STEADY STATE Insertion Limits if in CEA group 7, operation in modes 1 & 2 may continue.
- d. With one or more full length CEAs misaligned from any other CEAs in its group by more than 7.5 inches but less than 15 inches, operation in MODES 1 and 2 may continue, provided that within one hour the misaligned CEA(s) is either:
 1. Restored to OPERABLE status within its above specified alignment requirements, or

* See Special Test Exceptions 3.10.2 and 3.10.5.

ST. LUCIE - UNIT 1

3/4 1-20

Amendment No. 27

8507290394 850719
PDR ADDCK 05000335
P PDR

REACTIVITY CONTROL SYSTEMS

FULL LENGTH CEA POSITION (Continued)

LIMITING CONDITION FOR OPERATION (Continued)

2. Declared inoperable AND SATISFY SHUTDOWN MARGIN REQUIREMENTS 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 for up to 7 days per occurrence with a total accumulated time of ≤ 14 days per calendar year provided all of the following conditions are met:

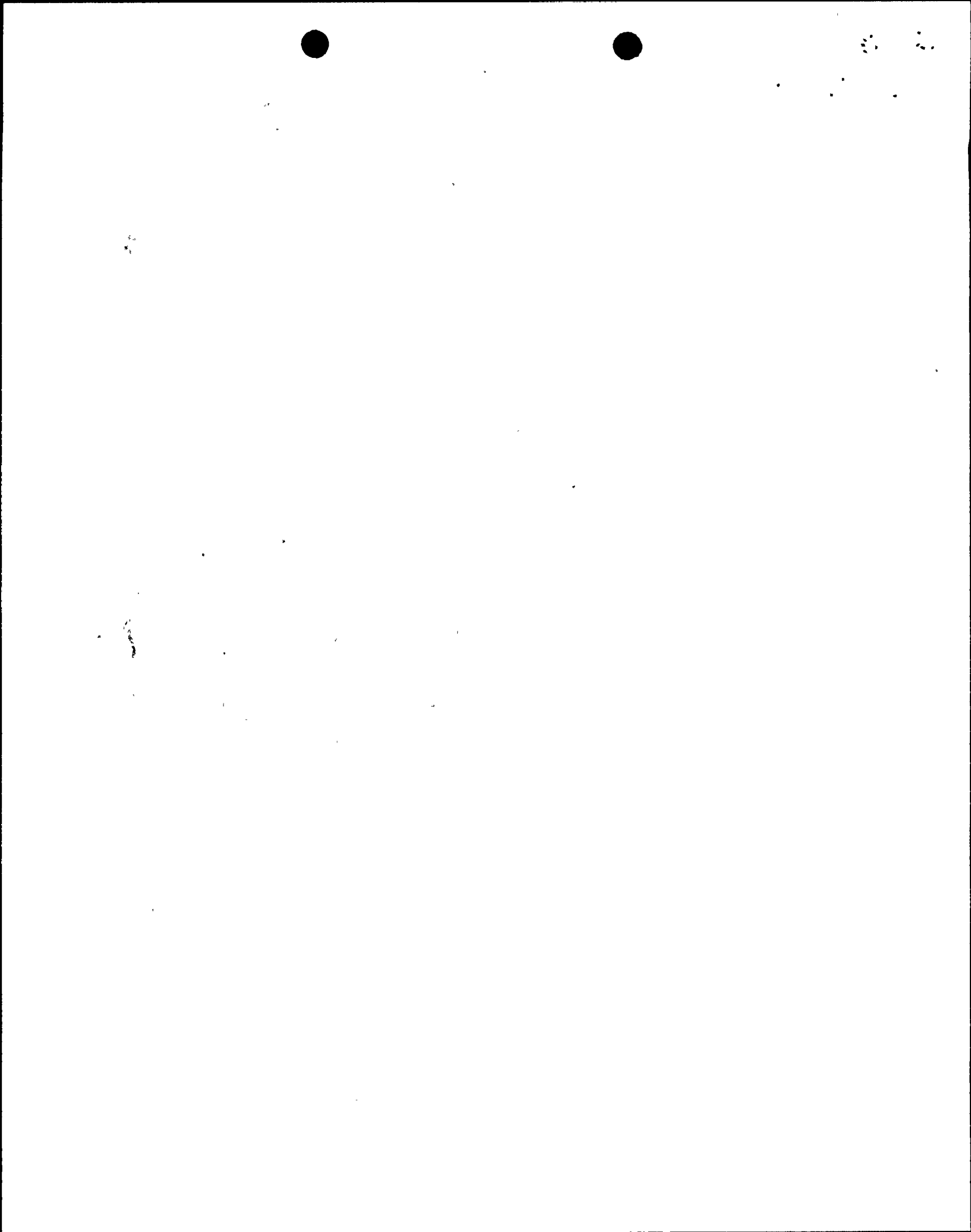
- a) ~~The THERMAL POWER level shall be reduced to $\leq 70\%$ of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination within one hour; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used.~~
- a) WITHIN ONE HOUR THE REMAINDER OF THE CEAs IN THE GROUP WITH THE INOPERABLE CEA shall be aligned to within 7.5 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 3.1.3.6 during subsequent operation
- ~~b) Within one hour after reducing the THERMAL POWER as required by a) above, the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7.5 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.~~
- 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 6 hours.

- e. With one full length CEA misaligned from any other CEA in its group by 15 inches or more, ~~reduces THERMAL POWER to $\leq 70\%$ of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination within one hour; if negative reactivity insertion is required to reduce THERMAL POWER, boration shall be used. Within one hour after reducing THERMAL POWER as required above, either~~

OR MORE INCHES, OPERATION IN MODES 1 & 2 MAY CONTINUE PROVIDED THAT THE MISALIGNED CEA IS POSITIONED WITHIN 7.5 INCHES OF THE OTHER CEAs IN ITS GROUP IN ACCORDANCE WITH THE TIME CONSTRAINTS SHOWN IN Figure 3.1-2.

- f) WITH ONE FULL-LENGTH CEA MISALIGNED FROM ANY OTHER CEA IN ITS GROUP BY 15 OR MORE INCHES BEYOND THE TIME CONSTRAINTS SHOWN IN Figure 3.1-2 reduce power to $\leq 70\%$ of RATED THERMAL POWER prior to completing ACTION f.1 or f.2



~~1. Restore the CEA to within the above specified alignment requirements, or~~

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

~~2. Declare the CEA inoperable. After declaring the CEA inoperable, POWER OPERATION may continue for up to 7 days per occurrence with a total accumulated time of 14 days per calendar year provided the remainder of the CEAs in the group with the inoperable CEA are aligned to within 7.5 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.~~

ST. LUCIE - UNIT 1

3/4 1-21

2. DECLARE THE CEA INOPERABLE AND SATISFY THE SHUTDOWN MARGIN requirements 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 7.5 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

b) THE SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is DETERMINED AT LEAST ONCE PER 12 hours.

REACTIVITY CONTROL SYSTEMS

FULL LENGTH CEA POSITION (Continued)

LIMITING CONDITION FOR OPERATION (Continued)

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

h) With one full length CEA inoperable due to causes other than addressed by ACTION 2, 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

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length CEA shall be determined to be within 7.5 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 shall be determined to be OPERABLE by inserting it at least 7.5 inches at least once per 31 days.

4.1.3.1.3 The CEA Block Circuit shall be demonstrated OPERABLE at least once per 31 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 7.5 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:

*a. Prior to each entry into MODE 2 from MODE 3, except that such verification need not be performed more often than once per 31 days, and

.. At least once per 6 months.

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



22 22

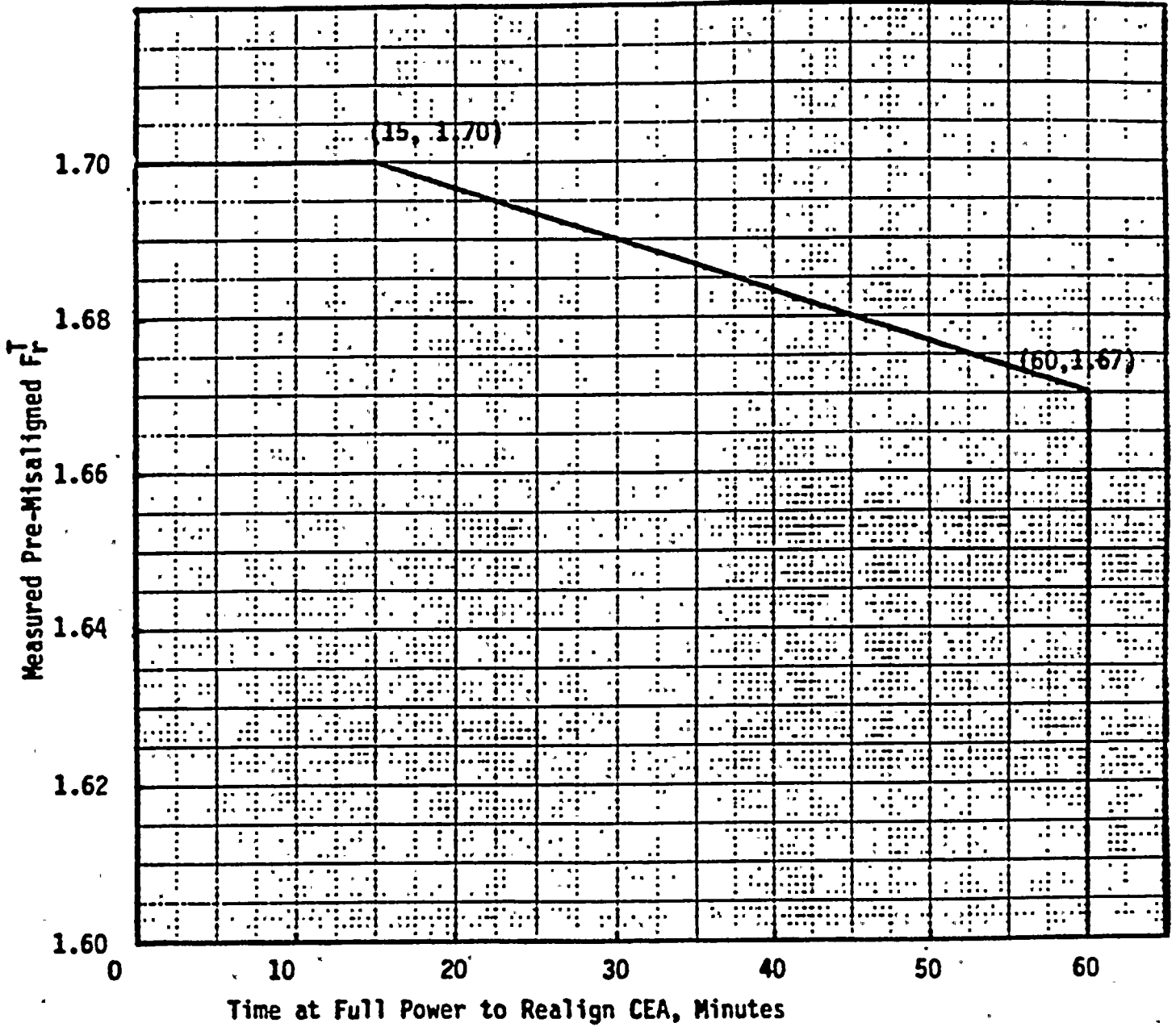


Figure 3.1-1a Allowable Time to Realign CEA vs. Initial Fr^T

REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.2 BORATION SYSTEMS (Continued)

The boron addition capability after the plant has been placed in MODES 5 and 6 requires either 1660 gallons of 8% boric acid solution from the boric acid tanks or 1630 gallons of 1720 ppm borated water from the refueling water tank to makeup for contraction of the primary coolant that could occur if the temperature is lowered from 200°F to 140°F.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a CEA ejection accident are limited to acceptable levels.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original criteria are met.

The ACTION statements applicable to an immovable or untrippable CEA and to a large misalignment (≥ 15 inches) of two or more CEAs, require a prompt shutdown of the reactor since either of these conditions may be indicative of a possible loss of mechanical functional capability of the CEAs and in the event of a stuck or untrippable CEA, the loss of SHUTDOWN MARGIN.

Effect: For small misalignments (< 15 inches) of the CEAs, there is 1) a small degradation in the peaking factors relative to those assumed in generating LCOs and LSSS setpoints for DNBR and linear heat rate, 2) a small effect on the time dependent long term power distributions relative to those used in generating LCOs and LSSS setpoints for DNBR and linear heat rate, 3) a small effect on the available SHUTDOWN MARGIN, and 4) a small effect on the ejected CEA worth used in the safety analysis. Therefore, the ACTION statement associated with the small misalignment of a CEA permits a one hour time interval during which attempts may be made to restore the CEA to within its alignment requirements prior to initiating a reduction in THERMAL POWER. The one hour time limit is sufficient to (1) identify causes of a misaligned CEA, (2) take appropriate corrective action to realign the CEAs and (3) minimize the effects of xenon redistribution.

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. The reactor

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 LCO'S 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.

BASES

3/4.1.3 MOVABLE CONTROL ASSEMBLIES (Continued)

~~protective system would not detect the degradation in radial peaking factors and since variations in other system parameters (e.g., pressure and coolant temperature) may not be sufficient to cause trips, it is possible that the reactor could be operating with process variables less conservative than those assumed in generating LCO and LSSS setpoints. Therefore, the ACTION statement associated with the large misalignment of a CEA requires a prompt and significant reduction in THERMAL POWER prior to attempting 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_T^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 DERATED CEA HAS BEEN INOPERABLE. THIS TIME ALLOWED TO CONTINUED OPERATION AT A REDUCED POWER LEVEL CAN BE PERMITTED FOR THE FOLLOWING REASONS:

1. THE MARGIN CALCULATIONS WHICH SUPPORT THE Technical Specifications ARE BASED ON A STEADY-STATE RADIAL PEAK OF $F_T^T > 1.70$.
2. WHEN THE ACTUAL $F_T^T \leq 1.70$, SIGNIFICANT ADDITIONAL MARGIN EXISTS
3. THIS ADDITIONAL MARGIN CAN BE CREDITED TO OFFSET THE INCREASE IN F_T^T WITH TIME THAT CAN OCCUR FOLLOWING A CEA MISALIGNMENT.
4. THIS INCREASE IN F_T^T IS CAUSED BY XENON REDISTRIBUTION.
5. THE PRESENT ANALYSIS CAN SUPPORT ALLOWING A MISALIGNMENT TO EXIST FOR UP TO 60 MINUTES WITHOUT CORRECTION, IF THE INITIAL $F_T^T \leq 1.67$.

Operability of the CEA position indicators (Specification 3.1.3.3) is required to determine CEA positions and thereby ensure compliance with the CEA alignment and insertion limits and ensures proper operation of the rod block circuit. The CEA "Full In" and "Full Out" limits provide an additional independent means for determining the CEA positions when the CEAs are at either their fully inserted or fully withdrawn positions. Therefore, the ACTION statements applicable to inoperable CEA position indicators permit continued operations when the positions of CEAs with inoperable position indicators can be verified by the "Full In" or "Full Out" limits.

CEA positions and OPERABILITY of the CEA position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCO's are satisfied.

The maximum CEA drop time permitted by Specification 3.1.3.4 is the assumed CEA drop time of 3.1 seconds used in the safety analyses. Measurement with $T_{avg} \geq 515^\circ\text{F}$ and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

STATE OF FLORIDA)
)
COUNTY OF DADE) ss.

J. W. Williams, Jr. being first duly sworn, deposes and says:

That he is a Group Vice President of Florida Power & Light Company, the Licensee herein;

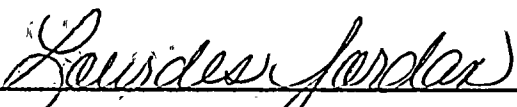
That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information, and belief, and that he is authorized to execute the document on behalf of said Licensee.



J. W. Williams, Jr.

Subscribed and sworn to before me this

19th day of July, 1985.



Louise Jordan

NOTARY PUBLIC, in and for the County
of Dade, State of Florida

My Commission expires: Dec 8, 1988

