

PROPOSED TECHNICAL SPECIFICATIONS

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## REACTIVITY CONTROL SYSTEMS

### 3/4.1.3 MOVABLE CONTROL ASSEMBLIES

#### CEA POSITION

#### LIMITING CONDITION FOR OPERATION

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3.1.3.1 All full length (shutdown and regulating) CEAs, and all part length CEAs which are inserted in the core, shall be OPERABLE with each CEA of a given group positioned within 7 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 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.
- c. 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causes other than addressed by ACTION a, above, but within its above specified alignment requirements and either fully withdrawn or within the Long Term Steady State Insertion Limits if in full length CEA group 6, operation in MODES 1 and 2 may continue.
- d. With one or more full length or part length CEAs misaligned from any other CEAs in its group by more than 7 inches but less than or equal to 19 inches, operation in MODES 1 and 2 may continue, provided that core power is reduced in accordance with Figure 3.1-1A and 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 3.10.4.)

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### ACTION: (Continued)

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 one hour the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7 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 or part length CEA misaligned from any other CEA in its group by more than 19 inches, operation in MODES 1 and 2 may continue, provided that core power is reduced in accordance with Figure 3.1-1A and that within one hour the misaligned CEA 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 one hour the remainder of the CEAs in the group with the inoperable CEA shall be aligned to within 7 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.

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### ACTION: (Continued)

- f. With one part length CEA inoperable and inserted in the core, operation may continue provided the alignment of the inoperable PLCEA is maintained within 7 inches (indicated position) of all other PLCEAs in its group.
- g. With more than one full length or part length CEA inoperable or misaligned from any other CEA in its group by more than 19 inches (indicated position), be in at least HOT STANDBY within 6 hours.

### SURVEILLANCE REQUIREMENTS

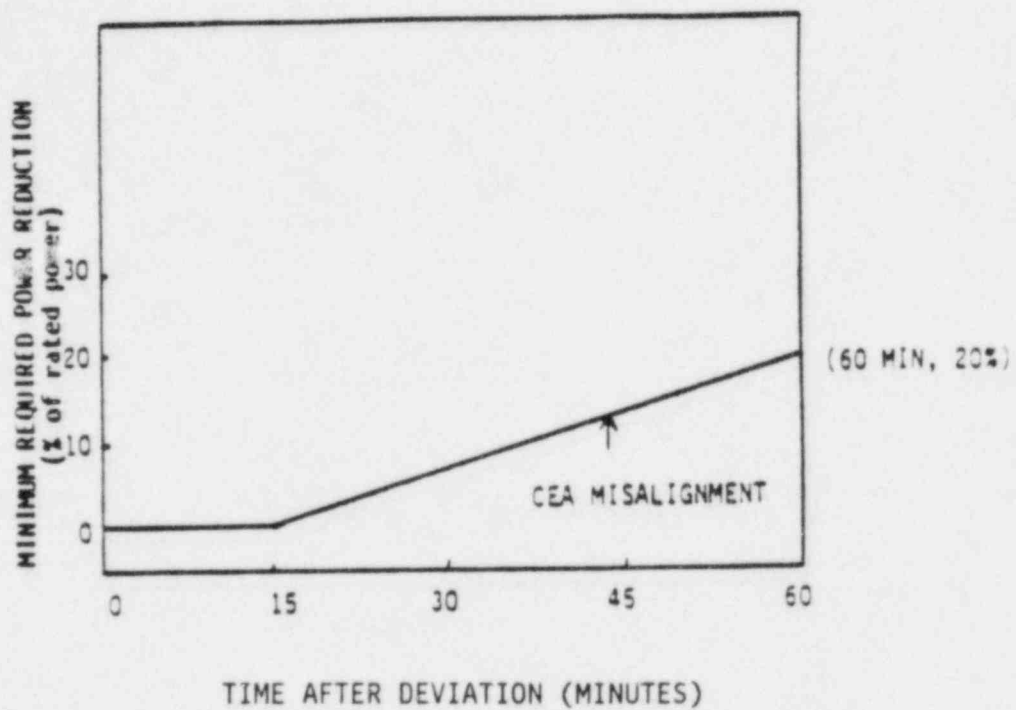
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4.1.3.1.1 The position of each full length and part length CEA shall be determined to be within 7 inches (indicated position) of all other CEAs in its group at least once per 12 hours.

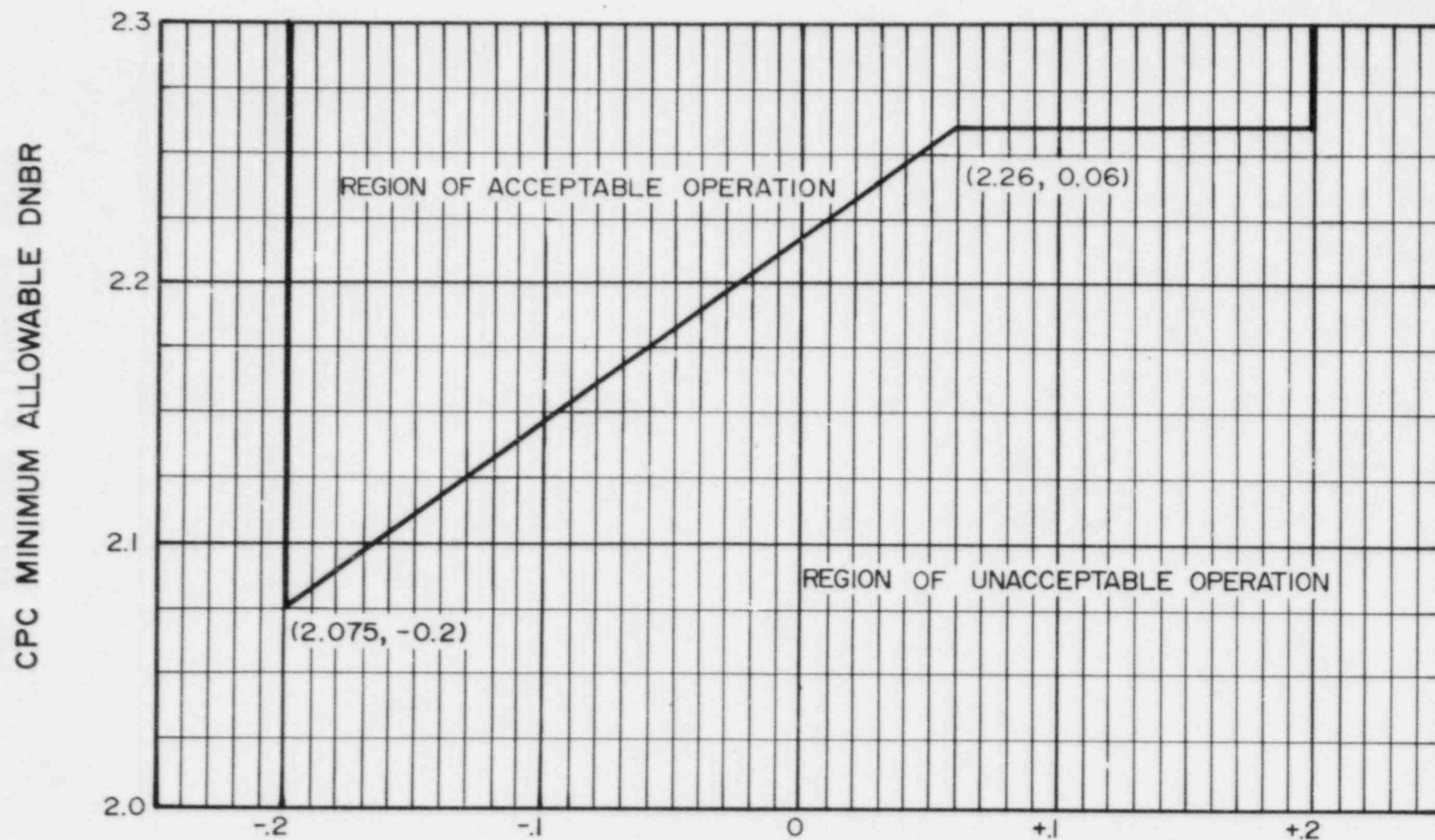
4.1.3.1.2 Each full length CEA not fully inserted and each part length CEA which is inserted in the core shall be determined to be OPERABLE by movement of at least 5 inches in any one direction at least once per 31 days.

FIGURE 3.1 - 1A

Required Power Reduction After CEA Deviation\*



- \* When core power is reduced to 60% of rated power per this limit curve, further reduction is not required by this specification.



CORE AVERAGE AXIAL SHAPE INDEX

FIGURE 3.2-4

DNBR MARGIN OPERATING LIMIT BASED ON CORE PROTECTION CALCULATORS  
(COLSS OUT OF SERVICE)



## ATTACHMENT 1

### Description of amendment request:

The proposed amendment would change Technical Specification 3.1.3, "Moveable Control Element Assemblies." This Technical Specification requires that (1) acceptable power distribution limits are maintained, (2) the minimum shutdown margin is maintained and (3) the potential effects of Control Element Assembly (CEA) misalignment are limited to acceptable levels. Technical Specification 3.1.3.1 requires that all full and part length CEAs be moveable and operable and specifies the maximum allowed deviation in the position of a single CEA from any other CEA within its group. Technical Specification 3.1.3.6 specifies the allowable CEA withdrawal and insertion limits. Technical Specification 3.1.3.7 specifies insertion position limits and insertion time limits for part length CEAs. The requirements of these specifications are implemented by the Core Protection Calculator (CPC) and Core Element Assembly Calculator (CEAC) software, which applies penalty factors in the calculation of Departure from Nucleate Boiling Ratio (DNBR) and Local Power Density (LPD) upon the detection of a CEA position deviation.

Technical Specification 3.2.4 requires that the DNBR margin be maintained by operating within the region of acceptable operation of Figure 3.2-3 or 3.2-4, as applicable. Figure 3.2-3 specifies the DNBR margin operating limit based on the Core Operating Limit Supervisory System (COLSS). Figure 3.2-4 specifies the DNBR margin operating limit based on the CPCs and is used when the COLSS is out of service.

Surveillance Requirement 4.1.3.1.1 requires that the position of each full and part length CEA periodically be determined to be within specified limits.

The proposed change revises Technical Specification 3.1.3.1 to require a reduction in core power after a detection of a CEA deviation (i.e., one CEA is inserted 7 or more inches further than the other CEAs in its group) rather than the application of penalty factors in the calculation of DNBR and LPD as required by the existing Technical Specification. The power reduction is in accordance with the new Figure 3.1-1A. Application of the existing penalty factors in the CPC/CEAC software will typically result in a reactor trip when a CEA deviation occurs. The proposed reduction of these penalty factors will require a power reduction by the operator, but may prevent unnecessary reactor trips due to erroneous CEA position indication, electrical noise and actual CEA drops. The proposed change also revises Figure 3.2-4 to ensure that sufficient margin is reserved for the single CEA inward deviation event when the COLSS is out of service.

This change would provide assurance that the plant is operated within the acceptable fuel design limits and that the operators are required to compensate for the change of CEA inward deviation penalty factors.

An additional change to the related Surveillance Requirement 4.1.3.1.1 is also included with this amendment package to eliminate a redundant portion of this requirement. The requirement deleted from this specification is present in a more detailed format in Table 3.3-1 ACTION 5, which is a more appropriate location in the Technical Specifications.

#### BASIS FOR NO SIGNIFICANT HAZARDS DETERMINATION:

The proposed change does not involve a significant hazards consideration because operation of Arkansas Nuclear One Unit 2 in accordance with this change would not:

- (1) involve a significant increase in the probability or consequences of an accident previously evaluated. Analyses of various anticipated operational occurrences (AOOs) have shown that the current level of protection is preserved by this change. CEA drop events are analyzed as accidents. Available operating margin and administrative measures will assure the same degree of protection currently provided by the Technical Specification Limiting Conditions for Operation (LCOs) and the CPC/CEAC system is maintained.
- (2) create the possibility of a new or different kind of accident from any previously analyzed. It has been determined that a new or different kind of accident will not be possible due to this change. The reduction of the CEA inward deviation penalty factors greatly reduces the probability of an unnecessary automatic reactor trip on a CEA inward deviation event. This, in fact, may reduce the possibility of a new or different kind of accident by reducing the probability of unnecessary challenges to plant safety systems. Like non-CPC plants, corrective action by the operator is now required. This action, along with the available operating margin preserved by the Technical Specification LCOs, ensures that acceptable fuel design limits are not exceeded. Analyses of CEA drop events and other postulated AOOs have shown that this change cannot create the possibility of a new or different kind of accident.
- (3) involve a significant reduction in a margin of safety. The margin of safety is preserved by the available operating margin assured by the Technical Specification LCOs and the required operator action. This change, by reducing the probability of spurious reactor trips, may in fact increase the margin of safety.

The Commission has provided guidance concerning the application of the standards for determining whether a significant hazards consideration exists by providing certain examples (48 FR 14870) of amendments that are considered not likely to involve significant hazards consideration. Example (vi) relates to a change which either may result in some increase in the probability or consequences of a previously-analyzed accident or may in some way reduce a safety margin, but where the results are clearly within all acceptance criteria with respect to the system or component specified in the Standard Review Plan (SRP). Example (ii) relates to a change that constitutes an additional limitation, restriction or control not presently included in the Technical Specification: for example, a more stringent surveillance requirement. Example (i) is a purely administrative change: for example, a change to achieve consistency throughout the Technical Specifications, correction of an error, or a change in nomenclature.



In this case, the proposed change described above requires a reduction in core power following an inward CEA deviation event instead of applying penalty factors to the calculation of DNBR and LPD. The proposed modification is similar to Example (vi) in that the change may reduce in some way a margin of safety, but where the results are clearly within all acceptance criteria with respect to the system or component specified in the SRP. Section 4.3 of the SRP delineates acceptance criteria for reactivity control systems. Specifically, the reactivity control systems must assure with high probability that acceptable fuel design limits are not exceeded during normal operation or AOOs. The reduction of the penalty factors currently applied to the calculation of DNBR and LPD is accounted for by crediting the thermal margin reserved by the LCO on DNBR margin (Technical Specification 3.2.4) to accommodate various AOOs, and further compensated for by the reduction in core power following a CEA inward deviation event as required by the proposed specification. This will preserve the current level of protection and the margin to safety, and assure that acceptable fuel design limits are not exceeded.

The proposed change described above may also be considered similar to Example (ii) in that it constitutes an additional limitation, restriction or control not presently included in the Technical Specifications. Specifically, this change requires a power reduction per the new Figure 3.1-1A in the event of an actual CEA inward deviation.

The change to Surveillance Requirement 4.1.3.1.1 is a purely administrative change and is therefore similar to Example (i). The portion of this requirement proposed to be deleted is already present in a more detailed form in Table 3.3-1 ACTION 5, a more appropriate location. This change will achieve consistency by eliminating a redundant requirement.

Therefore, based on the above reasons, AP&L has determined that this Technical Specifications amendment package does not involve a significant hazards consideration.