

October 12, 1995

Mr. Jerry W. Yelverton  
Vice President, Operations ANO  
Entergy Operations, Inc.  
1448 S.R. 333  
Russellville, AR 72801

SUBJECT: ISSUANCE OF AMENDMENT NO. 169 TO FACILITY OPERATING LICENSE  
NO. NPF-6 - ARKANSAS NUCLEAR ONE, UNIT NO. 2 (TAC NO. M92064)

Dear Mr. Yelverton:

The Commission has issued the enclosed Amendment No. 169 to Facility Operating License No. NPF-6 for the Arkansas Nuclear One, Unit No. 2 (ANO-2). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated April 4, 1995.

The amendment deletes TS requirements associated with part length control assemblies.

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original Signed By:  
George Kalman, Senior Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosures: 1. Amendment No. 169 to NPF-6  
2. Safety Evaluation

cc w/encls: See next page

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*Handwritten notes:*  
 10/12/95  
 Enclosure  
 need to discuss  
 the new group  
 CEAs that are being  
 authorized in  
 revised  
 State  
 9/13/95

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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Sincerely,

A handwritten signature in black ink, appearing to read "George Kalman".

George Kalman, Senior Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-368

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cc w/encls: See next page

Mr. Jerry W. Yelverton  
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Arkansas Nuclear One, Unit 2

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

ENERGY OPERATIONS, INC.

DOCKET NO. 50-368

ARKANSAS NUCLEAR ONE, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 169  
License No. NPF-6

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Energy Operations, Inc. (the licensee) dated April 4, 1995, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-6 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 169, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective within 30 days of the issuance date.

FOR THE NUCLEAR REGULATORY COMMISSION



George Kalman, Senior Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: October 12, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 169

FACILITY OPERATING LICENSE NO. NPF-6

DOCKET NO. 50-368

Revise the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

<u>REMOVE PAGES</u>	<u>INSERT PAGES</u>
IV	IV
3/4 1-17	3/4 1-17
3/4 1-18	3/4 1-18
3/4 1-19	3/4 1-19
3/4 1-22	3/4 1-22
3/4 1-23	3/4 1-23
3/4 1-25	3/4 1-25
3/4 1-26	3/4 1-26
3/4 1-27	-
3/4 2-3	3/4 2-3
3/4 3-5b	3/4 3-5b
3/4 3-5c	3/4 3-5c
3/4 9-1	3/4 9-1
3/4 9-7	3/4 9-7
3/4 10-1	3/4 10-1
3/4 10-2	3/4 10-2
B 3/4 1-5	B 3/4 1-5
5-4	5-4
6-21	6-21
6-21a	6-21a

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

<u>SECTION</u>	<u>PAGE</u>
<u>3/4.0 APPLICABILITY</u> .....	3/4 0-1
<u>3/4.1 REACTIVITY CONTROL SYSTEMS</u>	
3/4.1.1 BORATION CONTROL	
Shutdown Margin - $T_{avg} > 200^{\circ}\text{F}$ .....	3/4 1-1
Shutdown Margin - $T_{avg} \leq 200^{\circ}\text{F}$ .....	3/4 1-3
Boron Dilution.....	3/4 1-4
Moderator Temperature Coefficient.....	3/4 1-5
Minimum Temperature for Criticality.....	3/4 1-6
3/4.1.2 BORATION SYSTEMS	
Flow Paths - Shutdown.....	3/4 1-7
Flow Paths - Operating.....	3/4 1-8
Charging Pump Shutdown.....	3/4 1-9
Charging Pumps Operating.....	3/4 1-10
Boric Acid Makeup Pumps - Shutdown.....	3/4 1-11
Boric Acid Makeup Pumps - Operating.....	3/4 1-12
Borated Water Sources - Shutdown.....	3/4 1-13
Borated Water Sources - Operating.....	3/4 1-15
3/4.1.3 CONTROL ELEMENT ASSEMBLIES	
CEA Position.....	3/4 1-17
Position Indicator Channels - Operating.....	3/4 1-20
Position Indicator Channels - Shutdown.....	3/4 1-22
CEA Drop Time.....	3/4 1-23
Shutdown CEA Insertion Limit.....	3/4 1-24
Regulating and Group P CEA Insertion Limits.....	3/4 1-25

REACTIVITY CONTROL SYSTEMS

3/4.1.3 CONTROL ELEMENT ASSEMBLIES

CEA POSITION

LIMITING CONDITION FOR OPERATION

---

3.1.3.1 All CEAs 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 CEA(s) 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 CEA trippable but 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 CEA trippable but 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 CEA group 6 or group P, operation in MODES 1 and 2 may continue.
- d. With more than one CEA trippable but inoperable due to causes other than addressed by ACTION (a), above, restore the inoperable CEA(s) to OPERABLE status within 72 hours, or be in at least HOT STANDBY within the next 6 hours.
- e. With one or more CEA(s) trippable but misaligned from any other CEA 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 the limits specified in the CORE OPERATING LIMITS REPORT and within 1 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.

REACTIVITY CONTROL SYSTEMS

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 specified in the CORE OPERATING LIMITS REPORT; 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 the next 6 hours.

f. With one CEA trippable but 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 the limits specified in the CORE OPERATING LIMITS REPORT and 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 specified in the CORE OPERATING LIMITS REPORT; 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 the next 6 hours.

REACTIVITY CONTROL SYSTEMS

ACTION (Continued)

- g. With more than one CEA trippable but 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

---

4.1.3.1.1 The position of each 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 CEA not fully 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.

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

---

3.1.3.3 At least one CEA Reed Switch Position Transmitter indicator channel shall be OPERABLE for each CEA not fully inserted.

APPLICABILITY: MODES 3\*, 4\* and 5\*.

ACTION:

With less than the above required position indicator channel(s) OPERABLE, immediately open the reactor trip breakers.

SURVEILLANCE REQUIREMENTS

---

4.1.3.3 Each of the above required CEA Reed Switch Position Transmitter indicator channel(s) shall be determined to be OPERABLE by performance of a CHANNEL FUNCTIONAL TEST at least once per 18 months.

\*With the reactor trip breakers in the closed position.

## REACTIVITY CONTROL SYSTEMS

### CEA DROP TIME

#### LIMITING CONDITION FOR OPERATION

---

3.1.3.4 The individual CEA drop time, from a fully withdrawn position, shall be  $\leq 3.5$  seconds and the arithmetic average of the CEA drop times of all CEAs, from a fully withdrawn position, shall be  $\leq 3.2$  seconds from when the electrical power is interrupted to the CEA drive mechanisms until the CEAs reach their 90 percent insertion positions with:

- a.  $T_{avg} \geq 525^{\circ}F$ , and
- b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 and 2.

#### ACTION:

- a. With the CEA drop times determined to exceed either of the above limits, restore the CEA drop times to within the above limits prior to proceeding to MODE 1 or 2.
- b. With the CEA drop times within limits but determined at less than full reactor coolant flow, operation may proceed provided THERMAL POWER is restricted to less than or equal to the maximum THERMAL POWER level allowable for the reactor coolant pump combination operating at the time of CEA drop time determination.

#### SURVEILLANCE REQUIREMENTS

---

4.1.3.4 The CEA drop time of all CEAs shall be demonstrated through measurement prior to reactor criticality:

- a. For all CEAs following each removal of the reactor vessel head,
- b. For specifically affected individuals CEAs following any maintenance on or modification to the CEA drive system which could affect the drop time of those specific CEAs, and
- c. At least once per 18 months.

REACTIVITY CONTROL SYSTEMS

REGULATING AND GROUP P CEA INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The regulating CEA groups and Group P CEAs shall be limited to the withdrawal sequence and to the insertion limits specified in the CORE OPERATING LIMITS REPORT with:

- a. CEA insertion between the Long Term Steady State Insertion Limit and the Transient Insertion Limit restricted to:
  - 1.  $\leq 5$  Effective Full Power Days per 30 Effective Full Power Day intervals, and
  - 2.  $\leq 14$  Effective Full Power Days per calendar year.
- b. CEA insertion between the Short Term Steady State Insertion Limit and the Transient Insertion Limit shall be restricted to  $\leq 4$  hours per 24 hour interval.

APPLICABILITY: MODES 1\* and 2\*<sup>#</sup>

ACTION:

- a. With the regulating CEA groups or Group P CEAs inserted beyond the Transient Insertion Limit, except for surveillance testing pursuant to Specification 4.1.3.1.2, within two hours either:
  - 1. Restore the regulating CEA groups or Group P CEAs 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 CORE OPERATING LIMITS REPORT
- b. With the regulating CEA groups or Group P CEAs inserted between the Long Term Steady State Insertion Limit and the Transient Insertion Limit for intervals  $> 5$  EFPD per 30 EFPD interval or  $> 14$  EFPD per calendar year, either:
  - 1. Restore the regulating groups or Group P CEAs to within the Long Term Steady State Insertion Limit within two hours, or
  - 2. Be in at least HOT STANDBY within 6 hours.

---

\* See Special Test Exceptions 3.10.2 and 3.10.4

<sup>#</sup>With  $K_{eff} \geq 1.0$ .

## REACTIVITY CONTROL SYSTEMS

### LIMITING CONDITION FOR OPERATION

---

ACTION: Continued)

- c. With the regulating CEA groups or Group P CEAs inserted between the ShortTerm Steady State Insertion Limit and the Transient Insertion Limit for intervals > 4 hours per 24 hour interval, operation may proceed provided any subsequent increase in thermal power is restricted to  $\leq 5\%$  of rated thermal power per hour.

### SURVEILLANCE REQUIREMENTS

---

4.1.3.6 The position of each regulating CEA group and Group P CEAs shall be determined to be within the Transient Insertion Limits at least once per 12 hours except during time intervals when the PDIL Alarm is inoperable, then verify the individual CEA positions at least once per 4 hours. The accumulated times during which the regulating CEA groups or Group P CEAs are inserted beyond the Long Term Steady State Insertion Limit or the Short Term Steady State Insertion Limit but within the Transient Insertion Limit shall be determined at least once per 24 hours.

POWER DISTRIBUTION LIMITS

AZIMUTHAL POWER - T<sub>q</sub>

LIMITING CONDITION FOR OPERATION

---

3.2.3 The AZIMUTHAL POWER TILT (T<sub>q</sub>) shall be less than or equal to the AZIMUTHAL POWER TILT Allowance used in the Core Protection Calculators (CPCs).

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.\*

ACTION:

- a. With the measured AZIMUTHAL POWER TILT determined to exceed the AZIMUTHAL POWER TILT Allowance used in the CPCs but within the limit specified in the CORE OPERATING LIMITS REPORT, within two hours either correct the power tilt or adjust the AZIMUTHAL POWER TILT Allowance used in the CPCs to greater than or equal to the measured value.
- b. With the measured AZIMUTHAL POWER TILT determined to exceed the limit specified in the CORE OPERATING LIMITS REPORT:
  1. Due to misalignment of a CEA, within 30 minutes verify that the Core Operating Limit Supervisory System (COLSS) (when COLSS is being used to monitor the core power distribution per Specifications 4.2.1 and 4.2.4) is detecting the CEA misalignment.
  2. Verify that the AZIMUTHAL POWER TILT is within its limit within 2 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Linear Power Level - High trip setpoints to  $\leq$  55% of RATED THERMAL POWER within the next 4 hours.
  3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the AZIMUTHAL POWER TILT is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

\*See Special Test Exception 3.10.2.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

- ACTION 4 -** With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.
- ACTION 5 -** With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, place the reactor trip breakers of the inoperable channel in the tripped condition within 1 hour or be in HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 1 hour for surveillance testing per Specification 4.3.1.1.1.
- ACTION 6 -**
- a. With one CEAC inoperable, operation may continue for up to 7 days provided that at least once per 4 hours, each CEA is verified to be within 7 inches (indicated position) or all other CEAs in its group. After 7 days, operation may continue provided that ACTION 6.b is met.
  - b. With both CEACs inoperable, operation may continue provided that:
    - 1. Within 1 hour the margin required by Specification 3.2.4.b (COLSS in service) or Specification 3.2.4.d (COLSS out of service) is satisfied.
    - 2. Within 4 hours:
      - a) All CEA groups are withdrawn to and subsequently maintained at the "Full Out" position, except during surveillance testing pursuant to the requirements of Specification 4.1.3.1.2 or for control when CEA group 6 may be inserted no further than 127.5 inches withdrawn.
      - b) The "RSPT/CEAC Inoperable" addressable constant in the CPCs is set to both CEACs inoperable.
      - c) The Control Element Drive Mechanism Control System (CEDMCS) is placed in and subsequently maintained in the "OFF" mode except during CEA motion permitted by a) above, when the CEDMCS may be operated in either the "Manual Group" or "Manual Individual" mode.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

3. At least once per 4 hours, all CEAs are verified fully withdrawn, except as permitted by 2. a) above, then verify at least once per 4 hours that the inserted CEAs are aligned within 7 inches (indicated position) of all other CEAs in their group.

ACTION 7 - With three or more auto restarts of one non-bypassed calculator during a 12-hour interval, demonstrate calculator OPERABILITY by performing a CHANNEL FUNCTIONAL TEST within the next 24 hours.

ACTION 8 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement restore the inoperable channel to OPERABLE status within 48 hours or open the affected reactor trip breakers within the next hour. The trip breakers associated with the inoperable channel may be closed for up to 1 hour for surveillance testing per Specification 4.3.1.1.

### 3/4.9 REFUELING OPERATIONS

#### BORON CONCENTRATION

##### LIMITING CONDITION FOR OPERATION

---

3.9.1 With the reactor vessel head unbolted or removed, the boron concentration of the reactor coolant and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of following reactivity conditions is met:

- a. Either a  $K_{eff}$  of 0.95 or less, which includes a 1%  $\Delta k/k$  conservative allowance for uncertainties, or
- b. A boron concentration of  $\geq 2500$  ppm, which includes a 50 ppm conservative allowance for uncertainties.

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  $\geq 40$  gpm if  $K_{eff}$  is reduced to  $\leq 0.95$  or the boron concentration is restored to  $\geq 2500$  ppm, whichever is the more restrictive. The provisions of Specification 3.0.3 are not applicable.

##### SURVEILLANCE REQUIREMENTS

---

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

- a. Removing or unbolting the reactor vessel head, and
- b. Withdrawal of any 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 and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

---

\*The reactor shall be maintained in MODE 6 when the reactor vessel head is unbolted or removed.

## REFUELING OPERATIONS

### REFUELING MACHINE OPERABILITY

#### LIMITING CONDITION FOR OPERATION

---

3.9.6 The refueling machine shall be used for movement of fuel assemblies and shall be OPERABLE with:

- a. A minimum capacity of 3750 pounds,
- b. An overload cut off limit of  $\leq 100$  pounds plus the combined weight of one fuel assembly, one CEA, and the grapple in the "fuel only" region, and
- c. An overload cut off limit of  $\leq 100$  pounds plus the combined weight of one fuel assembly, one CEA, the grapple, and the hoist box in the "fuel plus hoist box" region.

APPLICABILITY: During movement of CEAs or fuel assemblies within the reactor pressure vessel.

#### ACTION:

With the requirements for refueling machine OPERABILITY not satisfied, suspend its use from operations involving the movement of CEAs and fuel assemblies within the reactor pressure vessel. The provisions of Specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.9.6 The refueling machine shall be demonstrated OPERABLE within 72 hours prior to the start of movement of fuel assemblies within the reactor pressure vessel by performing a load test of at least 3750 pounds and demonstrating automatic load cut offs when the crane loads exceed 100 pounds plus the applicable loads.

### 3/4.10 SPECIAL TEST EXCEPTIONS

#### SHUTDOWN MARGIN

##### LIMITING CONDITION FOR OPERATION

---

3.10.1 The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 may be suspended for measurement of CEA worth and shutdown margin provided reactivity equivalent to at least the highest estimated CEA worth is available for trip insertion from OPERABLE CEA(s).

APPLICABILITY: MODE 2.

##### ACTION:

- a. With any CEA not fully inserted and with less than the above reactivity equivalent available for trip insertion, immediately initiate and continue boration at  $\geq 40$  gpm of 2500 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.
- b. With all CEAs inserted and the reactor subcritical by less than the above reactivity equivalent, immediately initiate and continue boration at  $\geq 40$  gpm of 2500 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

##### SURVEILLANCE REQUIREMENTS

---

4.10.1.1 The position of each CEA required either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.1.2 Each CEA not fully inserted shall be demonstrated capable of full insertion when tripped from at least the 50% withdrawn position within 7 days prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1.

SPECIAL TEST EXCEPTIONS

GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

---

3.10.2 The group height, insertion and power distribution limits of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.5, 3.1.3.6, 3.2.2, 3.2.3, 3.2.7 and the Minimum Channels OPERABLE requirement of Functional Unit 15 of Table 3.3-1 may be suspended during the performance of PHYSICS TESTS provided:

- a. The THERMAL POWER is restricted to the test power plateau which shall not exceed 85% of RATED THERMAL POWER, and
- b. The linear heat rate limit shall be maintained by either:
  1. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on linear heat rate (when COLSS is in service); or
  2. Operating within the region of acceptable operation as specified in the CORE OPERATING LIMITS REPORT using any operable CPC channel (when COLSS is out of service.)

APPLICABILITY: During startup and PHYSICS TESTS.

ACTION:

With any of the above limits being exceeded while any of the above requirements are suspended, either:

- a. Reduce THERMAL POWER sufficiently to satisfy the requirements of the above Specification, or
- b. Be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

---

4.10.2.1 The THERMAL POWER shall be determined at least once per hour during PHYSICS TESTS in which any of the above requirements are suspended and shall be verified to be within the test power plateau.

4.10.2.2 The linear heat rate shall be determined to be within its limits during PHYSICS TESTS above 5% of RATED THERMAL POWER in which any of the above requirements are suspended.

## REACTIVITY CONTROL SYSTEMS

### BASES

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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 average CEA drop time restriction is consistent with the assumed CEA drop time used in the accident analysis. The maximum CEA drop time restriction is used to limit the CEA drop time distribution about the average to that used in the accident analysis. Measurement with  $T_{avg} \geq 525^{\circ}\text{F}$  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.

The establishment of LSSS and LCOs require that the expected long and short term behavior of the radial peaking factors be determined. The long term behavior relates to the variation of the steady state radial peaking factors with core burnup and is affected by the amount of CEA insertion assumed, the portion of a burnup cycle over which such insertion is assumed and the expected power level variation throughout the cycle. The short term behavior relates to transient perturbations to the steady-state radial peaks due to radial xenon redistribution. The magnitudes of such perturbations depend upon the expected use of the CEAs during anticipated power reductions and load maneuvering. Analyses are performed based on the expected mode of operation of the NSSS (base load, load following, etc.) and from these analyses CEA insertions are determined and a consistent set of radial peaking factors are defined. The Long Term Steady State and Short Term Insertion Limits are determined based upon the assumed mode of operation used in the analyses and provide a means of preserving the assumptions on CEA insertions used. The limits specified serve to limit the behavior of the radial peaking factors within the bounds determined from analysis. The actions specified serve to limit the extent of radial xenon redistribution effects to those accommodated in the analyses. The Long and Short Term Insertion Limits of Specification 3.1.3.6 are specified for the plant which has been designed for primarily base loaded operation but which has the ability to accommodate a limited amount of load maneuvering.

The Transient Insertion Limits of Specification 3.1.3.6 and the Shutdown CEA Insertion Limits of Specification 3.1.3.5 ensure that 1) the minimum SHUTDOWN MARGIN is maintained, and 2) the potential effects of a CEA ejection accident are limited to acceptable levels. Long term operation at the Transient Insertion Limits is not permitted since such operation could have effects on the core power distribution which could invalidate assumptions used to determine the behavior of the radial peaking factors.

## DESIGN FEATURES

### DESIGN PRESSURE AND TEMPERATURE

5.2.2 The reactor containment building is designed and shall be maintained for a maximum internal pressure of 54 psig and a temperature of 300°F.

### 5.3 REACTOR CORE

#### FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 177 fuel assemblies with each fuel assembly containing a maximum of 236 fuel rods clad with Zircaloy-4. Each fuel rod shall have a nominal active fuel length of 150 inches and contain a maximum total weight of 2114 grams uranium. The initial core loading shall have a maximum enrichment of 2.99 weight percent U-235. Reload fuel shall be of low enrichment and similar in physical design to the initial core loading.

#### CONTROL ELEMENT ASSEMBLIES

5.3.2 The reactor core shall contain 81 control element assemblies.

### 5.4 REACTOR COOLANT SYSTEM

#### DESIGN PRESSURE AND TEMPERATURE

5.4.1 The reactor coolant system is designed and shall be maintained:

- a. In accordance with the code requirements specified in Section 5.2 of the FSAR with allowance for normal degradation pursuant of the applicable Surveillance Requirements,
- b. For a pressure of 2500 psia, and
- c. For a temperature of 650°F, except for the pressurizer which is 700°F.

CORE OPERATING LIMITS REPORT

6.9.5 The core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT prior to each reload cycle or any remaining part of a reload cycle.

6.9.5.1 The analytical methods used to determine the core operating limits addressed by the individual Technical Specifications shall be those previously reviewed and approved by the NRC for use at ANO-2, specifically:

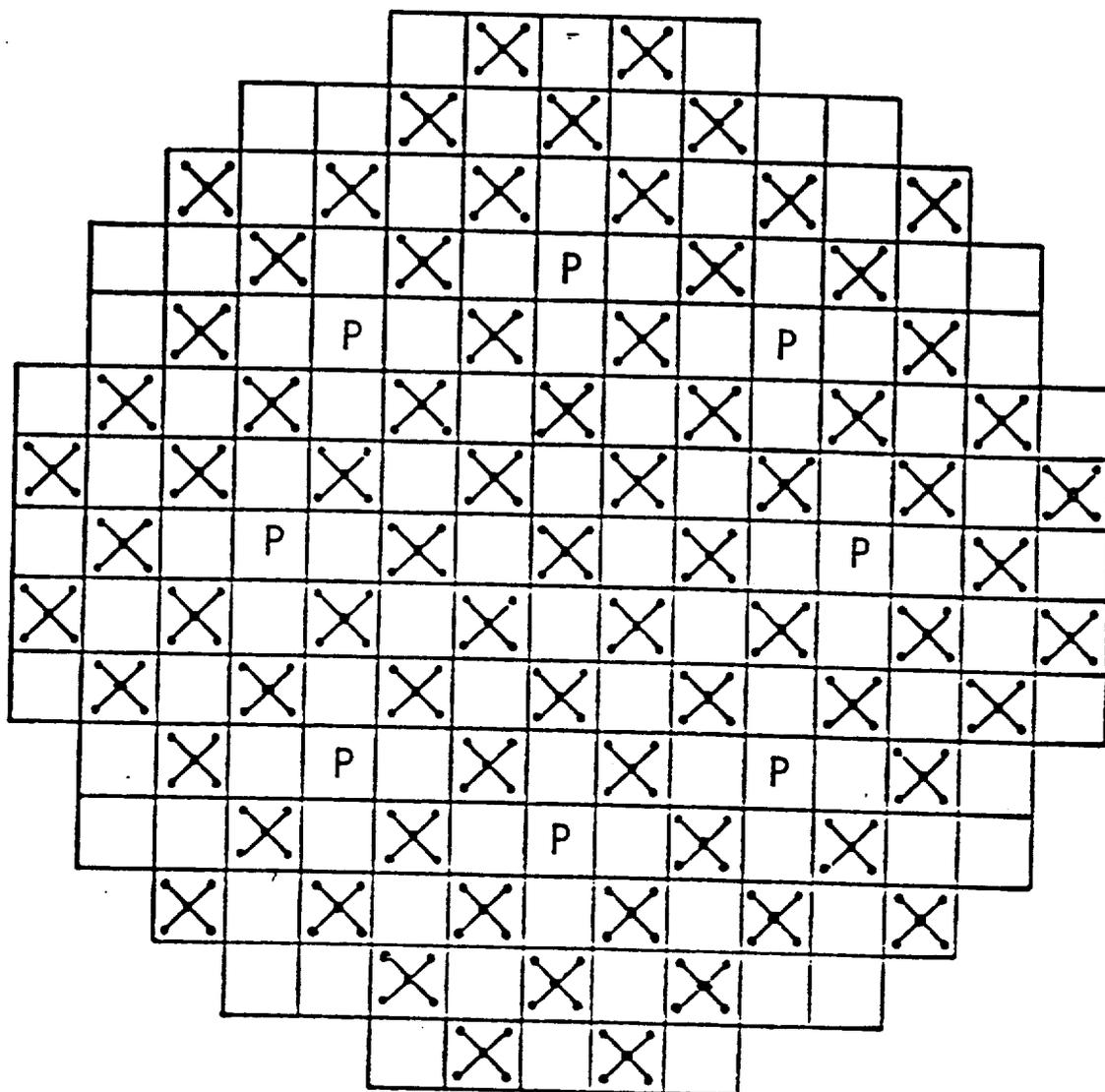
- 1) "The ROCS and DIT Computer Codes for Nuclear Design", CENPD-266-P-A, April 1983 (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.4 for MTC, 3.1.3.6 for Regulating and Group P CEA Insertion Limits, and 3.2.4.b for DNBR Margin).
- 2) "CE Method for Control Element Assembly Ejection Analysis," CENPD-0190-A, January 1976 (Methodology for Specification 3.1.3.6 for Regulating and Group P CEA Insertion Limits and 3.2.3 for Azimuthal Power Tilt).
- 3) "Modified Statistical Combination of Uncertainties, CEN-356(V)-P-A, Revision 01-P-A, May 1988 (Methodology for Specification 3.2.4.c and 3.2.4.d for DNBR Margin and 3.2.7 for ASI).
- 4) "Calculative Methods for the CE Large Break LOCA Evaluation Model," CENPD-132-P, August 1974 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).
- 5) "Calculational Methods for the CE Large Break LOCA Evaluation Model," CENPD-132-P, Supplement 1, February 1975 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).
- 6) "Calculational Methods for the CE Large Break LOCA Evaluation Model," CENPD-132-P, Supplement 2-P, July 1975 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).
- 7) "Calculative Methods for the CE Large Break LOCA Evaluation Model for the Analysis of CE and W Designed NSSS," CEN-132, Supplement 3-P-A, June 1985 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).
- 8) "Calculational Methods for the CE Small Break LOCA Evaluation Model," CENPD-137-P, August 1974 (Methodology for Specification 3.1.1.4 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

CORE OPERATING LIMITS REPORT

- 9) "CESEC-Digital Simulation of a Combustion Engineering Nuclear Steam Supply System," December 1981 (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margin, 3.1.1.4 for MTC, 3.1.3.1 for Movable Control Assemblies - CEA Position, 3.1.3.6 for Regulating CEA and Group P Insertion Limits, and 3.2.4.b for DNBR Margin).
- 10) Letter: O.D. Parr (NRC) to F.M. Stern (CE), dated June 13, 1975 (NRC Staff Review of the Combustion Engineering ECCS Evaluation Model). NRC approval for 6.9.5.1.4, 6.9.5.1.5, and 6.9.5.1.8 methodologies.
- 11) Letter: O.D. Parr (NRC) to A.E. Scherer (CE), dated December 9, 1975 (NRC Staff Review of the Proposed Combustion Engineering ECCS Evaluation Model changes). NRC approval for 6.9.5.1.6 methodology.
- 12) Letter: 2CNA038403, dated March 20, 1984, J.R. Miller (NRC) to J.M. Griffin (AP&L), "CESEC Code Verification." NRC approval for 6.9.5.1.9 methodology.

6.9.5.2 The core operating limits shall be determined so that all applicable limits (e.g. fuel thermal-mechanical limits, core thermal-hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met.

6.9.5.3 The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements thereto, shall be provided upon issuance to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.



 - FULL LENGTH CEA's    73

 - PART LENGTH CEA's    8

TOTAL = 81

ARKANSAS  
 POWER & LIGHT CO.  
 Arkansas  
 Nuclear One - Unit 2

CONTROL ELEMENT ASSEMBLY LOCATIONS

Figure  
 4.2-19



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 169 TO

FACILITY OPERATING LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT NO.2

DOCKET NO. 50-368

1.0 INTRODUCTION

By application dated April 4, 1995, Entergy Operations, Inc. (the licensee), submitted a request for changes to the Arkansas Nuclear One, Unit 2 (ANO-2), Technical Specifications (TSs). The proposed changes would delete the requirements associated with the part length control element assemblies (PLCEAs). The PLCEAs are being replaced with full length, full strength control element assemblies (CEAs) during outage number 11 in September/October 1995. The technical acceptability and the safety aspects of the modification were evaluated by the licensee under the 10 CFR Part 50.59 process. The proposed TS change merely updates the TSs to reflect the hardware configuration in the plant.

2.0 EVALUATION

In addition to the 73 full length CEAs, the ANO-2 reactor currently contains eight PLCEAs. The PLCEAs contain full strength neutron absorber sections in only the upper 10% of their length and are intended to provide control of axial power distribution. By the end of the current fuel cycle, Cycle 11, the CEAs will have operated to the end of their evaluated design life and will be replaced during the refueling outage. During this outage, the licensee will also replace the eight PLCEAs with full length CEAs and will designate this as Group P CEAs.

The licensee's operating experience has shown that the CEAs alone are capable of controlling axial power during plant operation and, therefore, PLCEAs are not necessary. In addition, replacement of the PLCEAs with full length CEAs will allow the Group P CEAs to be used as an additional control group and will provide additional shutdown reactivity worth. The addition of the full length rods is an enhancement to safety in that additional rods will be available to shut down the reactor. New power dependent insertion limits (PDILs) will be developed to allow this application and will be located in the ANO-2 Core Operating Limits Report (COLR). Based on these facts, the proposed TS changes which eliminate reference to PLCEAs are acceptable.

Enclosure

~~9510200322~~

### 3.0 TECHNICAL CONCLUSION

The staff has reviewed the proposed TS changes to ANO-2 which eliminate reference to PLCEAs and finds them acceptable since all PLCEAs will be replaced by full length CEAs during the next refueling outage.

### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arkansas State official was notified of the proposed issuance of the amendment. The State official had no comments.

### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (60 FR 37090). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

### 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: L. Kopp

Date: October 12, 1995