March 26, 1993

Docket No. 50-313

Mr. Jerry W. Yelverton
Vice President, Operations ANO
Entergy Operations, Inc.
Route 3 Box 137G
Russellville, Arkansas 72801

Dear Mr. Yelverton:

SUBJECT: ISSUANCE OF AMENDMENT NO. 164 TO FACILITY OPERATING LICENSE NO. DPR-51 - ARKANSAS NUCLEAR ONE, UNIT NO. 1 (TAC NO. M85005)

The Commission has issued the enclosed Amendment No. 164 to Facility Operating License No. DPR-51 for the Arkansas Nuclear One, Unit No. 1 (ANO-1). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated September 28, 1992.

The amendment modifies the required sodium hydroxide (NaOH) tank level specified in Technical Specification (TS) 3.3.4(B), deletes the value for the weight of NaOH specified in TS 3.3.4(B), and revises the Bases for TS 3.3.4 to reflect the new value of the NaOH tank level.

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:

Roby B. Bevan, Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 164 to DPR-51
2. Safety Evaluation

cc w/enclosures:
See next page

DISTRIBUTION

Docket File	NRC/Local PDR	PD4-1 Reading	OGC(MS15B18)
M. Virgilio	P. Noonan	R. Bevan(2)	OPA(MS2G5)
D. Hagan(MS3206)	G. Hill(2)	Wanda Jones(MS7103)	J. Roe
C. Grimes(MS11E22)	PD4-1 Plant File	ACRS(10) (MSP315)	R. Barrett
OC/LFMB(MS4503)	W. Johnson, RIV	G. Hubbard	

RL for

cp 1

OFC	LA:PD4-1	PM:PD4-1	SCSB	OGC	D:PD4-1
NAME	PNoonan	RBevan:pk	RBarrett	CPW	GHubbard
DATE	1/26/93	2/1/93	2/18/93	3/3/93	3/26/93

OFFICIAL RECORD COPY Document Name: CO085005.amd

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

March 26, 1993

Docket No. 50-313

Mr. Jerry W. Yelverton
Vice President, Operations ANO
Entergy Operations, Inc.
Route 3 Box 137G
Russellville, Arkansas 72801

Dear Mr. Yelverton:

SUBJECT: ISSUANCE OF AMENDMENT NO. 164 TO FACILITY OPERATING LICENSE NO. DPR-51 - ARKANSAS NUCLEAR ONE, UNIT NO. 1 (TAC NO. M85005)

The Commission has issued the enclosed Amendment No. 164 to Facility Operating License No. DPR-51 for the Arkansas Nuclear One, Unit No. 1 (ANO-1). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated September 28, 1992.

The amendment modifies the required sodium hydroxide (NaOH) tank level specified in Technical Specification (TS) 3.3.4(B), deletes the value for the weight of NaOH specified in TS 3.3.4(B), and revises the Bases for TS 3.3.4 to reflect the new value of the NaOH tank level.

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,

Roby B. Bevan, Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 164 to DPR-51
2. Safety Evaluation

cc w/enclosures:
See next page

cc:

Mr. Donald C. Hintz, President
and Chief Executive Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, Mississippi 39286

Mr. Charles B. Brinkman, Manager
Washington Nuclear Operations
ABB Combustion Engineering
Nuclear Power
12300 Twinbrook Parkway, Suite 330
Rockville, Maryland 20852

Mr. Nicholas S. Reynolds
Winston & Strawn
1400 L Street, N.W.
Washington, D.C. 20005-3502

Mr. Robert B. Borsum
Licensing Representative
B&W Nuclear Technologies
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
1 Nuclear Plant Road
Russellville, Arkansas 72801

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Honorable Joe W. Phillips
County Judge of Pope County
Pope County Courthouse
Russellville, Arkansas 72801

Ms. Greta Dicus, Director
Division of Radiation Control
and Emergency Management
Arkansas Department of Health
4815 West Markham Street
Little Rock, Arkansas 72205-3867

Mr. John R. McGaha
Vice President, Operations Support
Entergy Operations, Inc.
P. O. Box 31995
Jackson, Mississippi 39286

Mr. Robert B. McGehee
Wise, Carter, Child & Caraway
P. O. Box 651
Jackson, Mississippi 39286

Mr. James J. Fisicaro
Director, Licensing
Entergy Operations, Inc.
Route 3, Box 137G
Russellville, Arkansas 72801

Admiral Kinnaird R. McKee, USN (Ret)
214 South Morris Street
Oxford, Maryland 21654

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

ENTERGY OPERATIONS INC.

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 164
License No. DPR-51

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Entergy Operations, Inc. (the licensee) dated September 28, 1992, 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.

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. DPR-51 is hereby amended to read as follows:

   2. Technical Specifications

      The Technical Specifications contained in Appendix A, as revised through Amendment No. 164 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

George T. Hubbard, Acting Director
Project Directorate IV-1
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 26, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 164

FACILITY OPERATING LICENSE NO. DPR-51

DOCKET NO. 50-313

Replace 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.

REMOVE PAGES	INSERT PAGES
37	37
39	39

(I) The engineered safety features valves associated with each of the above systems shall be operable or locked in the ES position.

3.3.2 In addition to 3.3.1 above, the following ECCS equipment shall be operable when the reactor coolant system is above 350F and irradiated fuel is in the core:

(A) Two out of three high pressure injection (makeup) pumps shall be maintained operable, powered from independent essential buses, to provide redundant and independent flow paths.

(B) Engineered safety features valves associated with 3.3.2.a above shall be operable or locked in the ES position.

3.3.3 In addition to 3.3.1 and 3.3.2 above, the following ECCS equipment shall be operable when the reactor coolant system is above 800 psig:

(A) The two core flooding tanks shall each contain an indicated minimum of 13 ± 0.4 feet (1040 ± 30 ft^3) of borated water at 600 ± 25 psig.

(B) Core flooding tank boron concentration shall not be less than 2270 ppm boron.

(C) The electrically operated discharge valves from the core flood tanks shall be open and breakers locked open and tagged.

(D) One of the two pressure instrument channels and one of the two level instrument channels per core flood tank shall be operable.

3.3.4 The reactor shall not be made critical unless the following equipment in addition to 3.3.1, 3.3.2, and 3.3.3 above is operable.

(A) Two reactor building spray pumps and their associated spray nozzle headers and two trains of reactor building emergency cooling. The two reactor building spray pumps shall be powered from operable independent emergency buses and the two reactor building emergency cooling trains shall be powered from operable independent emergency buses.

(B) The sodium hydroxide tank shall contain an indicated

33.2 ± 1.8 ft. of $18^{+2.8}_{-3.0}$ wt % solution sodium hydroxide.

(C) All manual valves in the main discharge lines of the sodium hydroxide tanks shall be locked open.

370,100 gallons of borated water are supplied for emergency core cooling and reactor building spray in the event of a loss-of-coolant accident. This amount fulfills requirements for emergency core cooling. Approximately 16,000 gallons of borated water are required to reach cold shutdown. The original nominal borated water storage tank capacity of 380,000 gallons is based on refueling volume requirements. Heaters maintain the borated water supply at a temperature to prevent crystallization and local freezing of the boric acid. The boron concentration is set at a value that will maintain the core at least 1 percent $\Delta k/k$ subcritical at 70°F without any control rods in the core. The concentration for 1% $\Delta k/k$ subcriticality is 1609 ppm boron in the core, while the minimum value specified in the borated water storage tank is 2270 ppm boron.

Specification 3.3.2 assures that above 350°F two high pressure injection pumps are also available to provide injection water as the energy of the reactor coolant system is increased.

Specification 3.3.3 assures that above 800 psig both core flooding tanks are operational. Since their design pressure is 600 ± 25 psig, they are not brought into the operational state until 800 psig to prevent spurious injection of borated water. Both core flooding tanks are specified as a single core flood tank has insufficient inventory to reflood the core.(1)

Specification 3.3.4 assures that prior to going critical the redundant train of reactor building emergency cooling and spray train are operable.

The spray system utilizes common suction lines with the low pressure injection system. If a single train of equipment is removed from either system, the other train must be assured to be operable in each system.

Reference 6 provides an assessment of the impact of level indicator instrument error on the allowed NaOH tank level variation. Note that the indicated level variation of 33.2 ± 1.8 feet includes an allowance for instrument loop error.

When the reactor is critical, maintenance is allowed per Specification 3.3.5. Operability of the specified components shall be based on the results of testing as required by Technical Specification 4.5. The maintenance period of up to 24 hours is acceptable if the operability of equipment redundant to that removed from service is demonstrated within 24 hours prior to removal. Exceptions to Specification 3.3.6 permit continued operation for seven days if one of two BWST level instrument channels is operable or if either the pressure or level instrument channel in the CFT instrument channel is operable.

In the event that the need for emergency core cooling should occur, functioning of one train (one high pressure injection pump, one low pressure injection pump, and both core flooding tanks) will protect the core and in the event of a main coolant loop severance, limit the peak clad temperature to less than 2200°F and the metal-water reaction to that representing less than 1 percent of the clad.

The service water system consists of two independent but interconnected, full capacity, 100% redundant systems, to ensure continuous heat removal.(4)

One service water pump is required for normal operation. The normal operating requirements are greater than the emergency requirements following a loss-of-coolant accident.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 164 TO

FACILITY OPERATING LICENSE NO. DPR-51

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT NO. 1

DOCKET NO. 50-313

1.0 INTRODUCTION

By letter dated September 28, 1992, the licensee (Entergy Operations, Inc.) submitted a license amendment request for Arkansas Nuclear One, Unit 1 (ANO-1). The amendment modifies the required sodium hydroxide (NaOH) tank level specified in Technical Specification (TS) 3.3.4(B). Also, the value for the weight of NaOH specified in TS 3.3.4(B) is deleted, and the Bases for TS 3.3.4 are revised to reflect the new level value. The changes are required to reduce the number of nuisance alarms received in the control room because of the limitations of available instrumentation combined with the narrow range of the NaOH tank level as currently specified in TS 3.3.4(B).

2.0 EVALUATION

The licensee has proposed to modify the limits on NaOH tank level indication specified in TS 3.3.4(B) from a value of 34 +1.0/-0.8 ft. to a value of 33.2 +1.8/-1.8 ft. The change is requested due to frequent nuisance alarms received in the control room caused by level monitoring instrument loop hysteresis.

The same reasoning that is being used to support the change in required NaOH level was used in modifying the Borated Water Storage Tank (BWST) required level approved by the NRC as Amendment No. 140, dated December 5, 1990. The licensee's analysis is based on consideration of the following areas:

1) Post loss-of-coolant accident (LOCA) Reactor Building (RB) water level,

2) Low pressure injection (LPI) and RB spray pump performance during post-LOCA RB sump recirculation,

3) post-LOCA RB pressure and temperature profiles,

4) post-LOCA offsite dose, and

5) RB sump vortexing analysis.

A review of the analyses associated with these general areas is summarized below. Since the maximum NaOH tank level of 35.0 ft. remains unchanged, only the minimum tank level is discussed in this review.

Post LOCA RB Water Level

The minimum post-LOCA RB sump water level calculations assume a minimum flow from the NaOH tank of 5,000 gallons, based upon an initial tank volume of 10,600 gallons. This initial volume corresponds to a minimum NaOH tank level of 30.7 ft.

LPI and RB Spray Pump Performance

The net positive suction head (NPSH) calculations for the LPI and RB spray pumps reference a minimum post-LOCA sump water level. The level calculation was based on assumed minimum levels in the reactor coolant system (RCS), BWST, core flood tanks, and NaOH tank. The minimum NaOH flow into the sump assumed for the purposes of the level calculation was 5000 gallons. This flow was based on an initial NaOH tank volume of 10,600 gallons (30.7 ft.). The LPI and RB spray pump NPSH values will not be adversely affected by the proposed change in the TS level of the NaOH tank.

Post LOCA RB Pressure and Temperature

The ANO-1 RB pressure and temperature analysis conservatively neglects the NaOH tank volume and therefore places no limiting assumptions on NaOH tank level or volume.

Post LOCA Off-Site Dose

The ANO-1 LOCA off-site dose consequences are analyzed for the maximum hypothetical accident and are based upon a minimum NaOH tank level of 30.7 ft. However, this analysis also assumes a minimum RB sump pH of 8.5. This pH assumption has been verified using a minimum NaOH tank level of 30.84 ft. Therefore, the bounding minimum NaOH tank level is shown to be 30.84 ft.

RB Sump Vortexing Analysis

On the basis of the results of the ANO post-accident water level analysis, the minimum post-LOCA sump level will be elevation 340.8 ft (Floor El. 336.5 ft + 4.27 ft.). This calculation was based on assumed minimum levels in the RCS, BWST, core flood tanks, and NaOH tank. The minimum NaOH flow into the sump assumed for the purposes of this calculation was 5000 gallons. This flow was based on an initial NaOH tank volume of 10,600 gallons (30.7 ft.). Vortex suppressers installed in the Unit 1 sump will effectively suppress vortexes for sump water levels above elevation 337.17 ft. Sump vortexing will therefore not be a problem, assuming an initial NaOH tank level of 30.7 ft.

Of the analyses affected by variations in minimum NaOH tank level, the post-LOCA offsite dose assumptions requiring a NaOH tank minimum level of 30.84 ft. are limiting. The potential instrument error for the NaOH tank level indication instrumentation is bounded by error values of +0.80 ft. and -0.47 ft. for the maximum and minimum NaOH tank safety analysis levels, respectively. Therefore, the maximum and minimum actual levels with the worst case instrument loop errors would be 35.80 ft. and 30.93 ft., respectively, which are within the bounds of the safety analysis. Other instrument error calculations using the same methodology have been reviewed and accepted by the NRC as documented in Amendment Nos. 137 and 138, both dated October 5, 1992.

The NRC staff has reviewed the licensee's justification for modifying the NaOH tank level setpoints and found it to be acceptable.

The weight of NaOH referenced in TS 3.3.4(B) is redundant information because NaOH tank level requirements and concentration requirements are specified. Deleting the weight of NaOH in TS 3.3.4(B) is considered an administrative change and is therefore acceptable.

The Bases change for TS 3.3.4 reflects the change in TS 3.3.4(B) by referencing the new NaOH tank level range and is therefore acceptable.

3.0 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.

4.0 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 in 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 (58 FR 6995). 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.

5.0 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: H. Rathbun

Date: March 26, 1993