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Docket No. 50-313

Mr. William Cavanaugh, III  
Vice President, Generation  
and Construction  
Arkansas Power & Light Company  
P. O. Box 551  
Little Rock, Arkansas 72203

Dear Mr. Cavanaugh:

The Commission has issued the enclosed Amendment No. 44 to Facility Operating License No. DPR-51 for Arkansas Nuclear One, Unit No. 1 (ANO-1). The amendment consists of changes to the Technical Specifications in response to your license amendment request dated March 28, 1977.

The amendment modifies the Technical Specifications to incorporate limiting conditions for operation, surveillance requirements and associated bases for the Reactor Building Purge Filtration System.

Copies of the Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

*m. faurite for*

Robert W. Reid, Chief  
Operating Reactors Branch #4  
Division of Operating Reactors

**Enclosures:**

- 1. Amendment No. 44 to DPR-51
- 2. Safety Evaluation
- 3. Notice of Issuance

cc: w/enclosures  
See next page

*CP*  
**7911200568** *GD*

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

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Docket No. **50-313**

**November 7, 1979**

Docketing and Service Section  
Office of the Secretary of the Commission

SUBJECT: ARKANSAS POWER & LIGHT COMPANY  
ARKANSAS NUCLEAR ONE, UNIT NO. 1

Two signed originals of the Federal Register Notice identified below are enclosed for your transmittal to the Office of the Federal Register for publication. Additional conformed copies ( **12** ) of the Notice are enclosed for your use.

- Notice of Receipt of Application for Construction Permit(s) and Operating License(s).
- Notice of Receipt of Partial Application for Construction Permit(s) and Facility License(s): Time for Submission of Views on Antitrust Matters.
- Notice of Availability of Applicant's Environmental Report.
- Notice of Proposed Issuance of Amendment to Facility Operating License.
- Notice of Receipt of Application for Facility License(s); Notice of Availability of Applicant's Environmental Report; and Notice of Consideration of Issuance of Facility License(s) and Notice of Opportunity for Hearing.
- Notice of Availability of NRC Draft/Final Environmental Statement.
- Notice of Limited Work Authorization.
- Notice of Availability of Safety Evaluation Report.
- Notice of Issuance of Construction Permit(s).
- Notice of Issuance of Facility Operating License(s) or Amendment(s).
- Other: Amendment No. 44

**Referenced documents have been provided PDR.**

**Division of Operating Reactors, ORB#4**  
Office of Nuclear Reactor Regulation

Enclosure:  
As Stated

OFFICE →	ORB#4: DOR <i>RI</i>					
SURNAME →	R. Ingram					
DATE →	11/7/79					

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-313ARKANSAS POWER & LIGHT COMPANYNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY  
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 44 to Facility Operating License No. DPR-51, issued to Arkansas Power & Light Company (the licensee), which revised the Technical Specifications for operation of Arkansas Nuclear One, Unit No. 1 (the facility) located in Pope County, Arkansas. The amendment is effective as of the date of issuance.

The amendment modifies the Technical Specifications to incorporate limiting conditions for operation, surveillance requirements and associated bases for the Reactor Building Purge Filtration System.

This application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4), an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

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For further details with respect to this action, see (1) the licensee's application for amendment dated March 28, 1977, (2) Amendment No. 44 to License No. DPR-51, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D. C. and at the Arkansas Polytechnic College, Russellville, Arkansas. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 7th day of November, 1979.

FOR THE NUCLEAR REGULATORY COMMISSION

*Morton B. Fairtile*

Morton B. Fairtile, Acting Chief  
Operating Reactors Branch #4  
Division of Operating Reactors



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

November 7, 1979

Docket No. 50-313

Mr. William Cavanaugh, III  
Vice President, Generation  
and Construction  
Arkansas Power & Light Company  
P. O. Box 551  
Little Rock, Arkansas 72203

Dear Mr. Cavanaugh:

The Commission has issued the enclosed Amendment No.44 to Facility Operating License No. DPR-51 for Arkansas Nuclear One, Unit No. 1 (ANO-1). The amendment consists of changes to the Technical Specifications in response to your license amendment request dated March 28, 1977.

The amendment modifies the Technical Specifications to incorporate limiting conditions for operation, surveillance requirements and associated bases for the Reactor Building Purge Filtration System.

Copies of the Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

*Morton B. Fairtile for*

Robert W. Reid, Chief  
Operating Reactors Branch #4  
Division of Operating Reactors

Enclosures:

1. Amendment No.44 to DPR-51
2. Safety Evaluation
3. Notice of Issuance

cc: w/enclosures  
See next page

Arkansas Power & Light Company

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

ARKANSAS POWER & LIGHT COMPANY

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE - UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 44  
License No. DPR-51

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Arkansas Power & Light Company (the licensee) dated March 28, 1977, 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 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 Appendices A and B, as revised through Amendment No. 44, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*Morton B. Fairtile for*

Robert W. Reid, Chief  
Operating Reactors Branch #4  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: November 7, 1979

ATTACHMENT TO LICENSE AMENDMENT NO. 44

FACILITY OPERATING LICENSE NO. DPR-51

DOCKET NO. 50-313

Revise Appendix A Technical Specifications as follows:

Remove Pages

i & ii

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Insert Pages

i & ii

66r & 66s

110x & 110y

Changes on the revised pages are identified by marginal lines.

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
1.	<u>DEFINITIONS</u>	1
1.1	RATED POWER	1
1.2	REACTOR OPERATING CONDITIONS	1
1.3	OPERABLE	2
1.4	PROTECTION INSTRUMENTATION LOGIC	2
1.5	INSTRUMENTATION SURVEILLANCE	3
1.6	QUADRANT POWER TILT	4
1.7	REACTOR BUILDING	4
1.8	FIRE SUPPRESSION WATER SYSTEM	5
2.	<u>SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS</u>	7
2.1	SAFETY LIMITS, REACTOR CORE	7
2.2	SAFETY LIMITS, REACTOR SYSTEM PRESSURE	10
2.3	LIMITING SAFETY SYSTEM SETTINGS, PROTECTIVE INSTRUMENTATION	11
3.	<u>LIMITING CONDITIONS FOR OPERATION</u>	16
3.1	<u>REACTOR COOLANT SYSTEM</u>	16
3.1.1	<u>Operational Components</u>	16
3.1.2	<u>Pressurization, Heatup and Cooldown Limitations</u>	18
3.1.3	<u>Minimum Conditions for Criticality</u>	21
3.1.4	<u>Reactor Coolant System Activity</u>	22
3.1.5	<u>Chemistry</u>	25
3.1.6	<u>Leakage</u>	27
3.1.7	<u>Moderator Temperature Coefficient of Reactivity</u>	30
3.1.8	<u>Low Power Physics Testing Restrictions</u>	31
3.1.9	<u>Control Rod Operation</u>	32
3.2	MAKEUP AND CHEMICAL ADDITION SYSTEMS	34
3.3	EMERGENCY CORE COOLING, REACTOR BUILDING COOLING, AND REACTOR BUILDING SPRAY SYSTEMS	36
3.4	STEAM AND POWER CONVERSION SYSTEM	40
3.5	INSTRUMENTATION SYSTEMS	42
3.5.1	<u>Operational Safety Instrumentation</u>	42
3.5.2	<u>Control Rod Group and Power Distribution Limits</u>	46
3.5.3	<u>Safety Features Actuation System Setpoints</u>	49
3.5.4	<u>In-Core Instrumentation</u>	51
3.5.5	<u>Fire Detection Instrumentation</u>	53d
3.6	REACTOR BUILDING	54
3.7	AUXILIARY ELECTRICAL SYSTEM	56
3.8	FUEL LOADING AND REFUELING	58
3.9	CONTROL ROOM EMERGENCY AIR CONDITIONING SYSTEM	60
3.10	SECONDARY SYSTEM ACTIVITY	66
3.11	EMERGENCY COOLING POND	66a
3.12	MISCELLANEOUS RADIOACTIVE MATERIALS SOURCES	66b
3.13	PENETRATION ROOM VENTILATION SYSTEM	66c
3.14	HYDROGEN PURGE SYSTEM	66e
3.15	FUEL HANDLING AREA VENTILATION SYSTEM	66g
3.16	SHOCK SUPPRESSORS (SNUBBERS)	66i
3.17	FIRE SUPPRESSION WATER SYSTEM	66m
3.18	FIRE SUPPRESSION SPRINKLER SYSTEMS	66n
3.19	CONTROL ROOM AND AUXILIARY CONTROL ROOM HALON SYSTEMS	66o
3.20	FIRE HOSE STATIONS	66p
3.21	PENETRATION FIRE BARRIERS	66q
3.22	REACTOR BUILDING PURGE FILTRATION SYSTEM	66r

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
4.	<u>SURVEILLANCE REQUIREMENTS</u>	67
4.1	OPERATIONAL SAFETY ITEMS	67
4.2	REACTOR COOLANT SYSTEM SURVEILLANCE	76
4.3	REACTOR COOLANT SYSTEM INTEGRITY FOLLOWING ENTRY	78
4.4	REACTOR BUILDING	79
4.4.1	<u>Reactor Building Leakage Test</u>	79
4.4.2	<u>Structural Integrity</u>	85
4.5	EMERGENCY CORE COOLING SYSTEM AND REACTOR BUILDING COOLING SYSTEM PERIODIC TESTING	92
4.5.1	<u>Emergency Core Cooling System</u>	92
4.5.2	<u>Reactor Building Cooling System</u>	95
4.6	AUXILIARY ELECTRICAL SYSTEM TESTS	100
4.7	REACTOR CONTROL ROD SYSTEM TESTS	102
4.7.1	<u>Control Rod Drive System Functional Tests</u>	102
4.7.2	<u>Control Rod Program Verification</u>	104
4.8	EMERGENCY FEEDWATER PUMP TESTING	105
4.9	REACTIVITY ANOMALIES	106
4.10	CONTROL ROOM EMERGENCY AIR CONDITIONING SYSTEM SURVEILLANCE	107
4.11	PENETRATION ROOM VENTILATION SYSTEM SURVEILLANCE	109
4.12	HYDROGEN PURGE SYSTEM SURVEILLANCE	109b
4.13	EMERGENCY COOLING POND	110a
4.14	RADIOACTIVE MATERIALS SOURCES SURVEILLANCE	110b
4.15	AUGMENTED INSERVICE INSPECTION PROGRAM FOR HIGH ENERGY LINES OUTSIDE OF CONTAINMENT	110c
4.16	SHOCK SUPPRESSORS (SNUBBERS)	110e
4.16.1	<u>Hydraulic Shock Suppressors</u>	110e
4.17	<u>FUEL HANDLING AREA VENTILATION SYSTEM SURVEILLANCE</u>	110h
4.18	STEAM GENERATOR TUBING SURVEILLANCE	110j
4.19	FIRE DETECTION INSTRUMENTATION	110p
4.20	FIRE SUPPRESSION WATER SYSTEM	110q
4.21	SPRINKLER SYSTEMS	110t
4.22	CONTROL ROOM AND AUXILIARY CONTROL ROOM HALON SYSTEMS	110u
4.23	FIRE HOSE STATIONS	110v
4.24	PENETRATION FIRE BARRIERS	110w
4.25	REACTOR BUILDING PURGE FILTRATION SYSTEM	110x
5.	<u>DESIGN FEATURES</u>	111
5.1	SITE	111
5.2	REACTOR BUILDING	112
5.3	REACTOR	114
5.4	NEW AND SPENT FUEL STORAGE FACILITIES	116
6.	<u>ADMINISTRATIVE CONTROLS</u>	117
6.1	RESPONSIBILITY	117
6.2	ORGANIZATION	117
6.3	FACILITY STAFF QUALIFICATIONS	117
6.4	TRAINING	117
6.5	REVIEW AND AUDIT	117
6.6	REPORTABLE OCCURRENCE ACTION	126
6.7	SAFETY LIMIT VIOLATION	126
6.8	PROCEDURES	127
6.9	RECORD RETENTION	128
6.10	RADIATION PROTECTION PROGRAM	129
6.11	DELETED	129
6.12	REPORTING REQUIREMENTS	140

### 3.22 Reactor Building Purge Filtration System

#### Applicability

This specification applies to the operability of the reactor building purge filtration system.

#### Objective

To assure that the reactor building purge filtration system will perform within acceptable levels of efficiency and reliability.

#### Specification

- 3.22.1 The reactor building purge filtration system shall be operable whenever irradiated fuel handling operations are in progress in the reactor building and shall have the following performance capabilities:
- a. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows ( $\pm 10\%$ ) on HEPA filters and charcoal adsorber banks shall show  $> 99\%$  DOP removal and  $> 99\%$  halogenated hydrocarbon removal.
  - b. The results of laboratory carbon sample analysis shall show  $> 90\%$  radioactive methyl iodide removal at a velocity within  $\pm 20\%$  of system design,  $0.05$  to  $0.15$   $\text{mg}/\text{m}^3$  inlet methyl iodide concentration,  $> 70\%$  R. H. and  $> 125\text{F}$ .
  - c. Fans shall be shown to operate within  $\pm 10\%$  design flow.
  - d. The pressure drop across the combined HEPA filters and charcoal adsorber banks shall be less than 6 inches of water at system design flow rate ( $\pm 10\%$ ).
  - e. Air distribution shall be uniform within  $\pm 20\%$  across HEPA filters and charcoal adsorbers when tested initially and after any maintenance or testing that could affect the air distribution within the reactor building purge filtration system.
- 3.22.2 If the requirements of Specification 3.22.1 cannot be met, either:
- a. Irradiated fuel movement shall not be started (any irradiated fuel assembly movement in progress may be completed); or,
  - b. Isolate the reactor building purge system.

#### Bases

The reactor building purge filtration system is designed to filter the reactor building atmosphere during normal operations for ease of personnel entry into the reactor building. This specification is intended to require the system operable during fuel handling operations, if the system

is to be used, to limit the release of activity should a fuel handling accident occur. The system consists of one circuit containing a supply and an exhaust fan and a filter train. The filter train consists of a pre-filter, a HEPA filter and a charcoal adsorber in series.

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment. The in-place test results should indicate a system leak tightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of a least 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90 percent for expected accident conditions. If the efficiencies of the HEPA filters and charcoal adsorbers are as specified, the resulting doses will be less than the 10CFR100 guidelines for the accidents analyzed. Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers.

## 4.25 Reactor Building Purge Filtration System

### Applicability

Applies to the surveillance of the reactor building purge filtration system.

### Objective

To verify an acceptable level of efficiency and operability of the reactor building purge filtration system.

### Specification

- 4.25.1 The pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 6 inches of water at system design flow rate (+10%) within 720 system operating hours prior to initial irradiated fuel handling operations.
- 4.25.2 Initially and after any maintenance or testing that could affect the air distribution within the reactor building purge system, air distribution shall be demonstrated to be uniform within +20% across HEPA filters and charcoal adsorbers.
- 4.25.3a. The tests and sample analysis of Specification 3.22.1.a,b, & c. shall be performed within 720 system operating hours prior to initial irradiated fuel handling operations in the reactor building, and prior to irradiated fuel handling in the reactor building following significant painting, fire or chemical release in any ventilation zone communicating with the system.
  - b. Cold DOP testing shall also be performed prior to irradiated fuel handling in the reactor building after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing.
  - c. Halogenated hydrocarbon testing shall also be performed prior to irradiated fuel handling in the reactor building after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the system housing.

### Bases

Since the reactor building purge filtration system may be in operation when the reactor is operating, its operability must be verified before handling of irradiated fuel.

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than 6 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once per refueling period to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. The charcoal adsorber efficiency test procedures should allow for obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant and of the HEPA filter bank with DOP aerosol shall be performed in accordance with ANSI NS10 (1975) "Standard for Testing of Nuclear Air Cleaning Systems." Any HEPA filters found defective shall be replaced with filters qualified according to Regulatory Position C.3.d. of Regulatory Guide 1.52. Radioactive methyl iodide removal efficiency tests shall be performed in accordance with RDT Standard M16-IT. If laboratory test results are unacceptable, all charcoal adsorbents in the system shall be replaced with charcoal adsorbents qualified according to Regulatory Guide 1.52.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 44 TO

FACILITY OPERATING LICENSE NO. DPR-51

ARKANSAS POWER AND LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT NO. 1

DOCKET NO. 50-313

Introduction

By letter dated March 28, 1977, Arkansas Power and Light Company (the licensee) proposed amendment to Facility Operating License No. DPR-51 for Arkansas Nuclear One, Unit No. 1 (ANO-1). The amendment would modify the Technical Specifications (TS) to incorporate limiting conditions for operation, surveillance requirements, and associated bases for the Reactor Building Purge Filtration System (RBPFS).

Background

By letter dated January 16, 1977, we requested the licensee to evaluate the previously unevaluated potential consequences of a postulated Fuel Handling Accident Inside Containment (FHAIC) at ANO-1. The licensee responded with the proposed amendment.

The licensee stated that approval of the proposed TS would assure that the potential consequences of a postulated FHAIC are consistent with those postulated consequences of a fuel handling accident in the fuel handling area. The potential consequences of an accident in the fuel handling area were evaluated by the licensee in the ANO-1 Final Safety Analysis Report (FSAR) and by the NRC staff in the Safety Evaluation dated June 6, 1973. The licensee stated in the ANO-1 FSAR that the potential consequences of this postulated accident are 0.92 Rem thyroid and 0.54 Rem whole body at the Exclusion Area Boundary (EAB).

Evaluation

We have evaluated the licensee's proposed TS regarding the RBPFS. These TS are consistent with other specifications on ventilation filter systems in the ANO-1 Technical Specifications and are consistent with the testing requirements of R. G. 1.52 (Rev. 2). The proposed TS state that the charcoal filters in the RBPFS will be checked 720 system operating hours prior to irradiated fuel handling for 90% radioactive methyl iodine removal at 70% relative humidity. During refueling, the relative humidity inside containment will be significantly greater than 70% thus causing the charcoal filters' iodine removal efficiency to decrease. We have found that the RBPFS filters at ANO-1 are not equipped with heaters to compensate for increased humidity. Also, the charcoal will degrade during the system's

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operation thus decreasing its iodine removal efficiency. Therefore, we have concluded, because of the increased relative humidity and charcoal degradation during filter operation causing a decreased filter iodine removal efficiency and an additional margin of safety to assure a filter efficiency equal to or greater than that assumed in this evaluation during a FHAIC, the credit for the charcoal filters will be 50% for the total iodine removal efficiency.

We conclude that the proposed TS, when implemented, will provide adequate assurance that the potential consequences of a postulated FHAIC are appropriately within the guidelines of 10 CFR Part 100. Appropriately within the guidelines of 10 CFR Part 100 has been defined as less than 100 Rem to the thyroid. This is based on the probability of this event relative to other events which are evaluated against 10 CFR Part 100 exposure guidelines. Whole body doses were also examined, but they are not controlling due to decay of the short-lived radioisotopes prior to fuel handling.

Our assumptions and the resulting potential consequences at the EAB are given in Table 1. The potential consequences of this postulated accident at the low population zone boundary are less than those given for the EAB in Table 1.

A recent study<sup>1/</sup> has indicated that dropping a spent fuel assembly into the core during refueling operations may potentially cause damage to more fuel pins than has been assumed for evaluating the FHAIC. This study has indicated that up to all of the fuel pins in two spent fuel assemblies, the one dropped and the one hit, may be damaged because of the embrittlement of fuel cladding material from radiation in the core.

The probability of the postulated FHAIC is small. Not only have there been several hundred reactor-years of plant operating experience with only a few accidents involving spent fuel being dropped into the core, but none of these accidents has resulted in measurable releases of activity. The potential damage to spent fuel estimated by the study was based on the assumption that a spent fuel assembly falls about 14 feet directly onto one other assembly in the core, an impact which results in the greatest energy available for crushing the fuel pins in both assemblies. This type of impact is unlikely because the falling assembly would be subjected to drag forces in the water which should cause the assembly to skew out of a vertical fall path.

Based on the above, we have concluded that the likelihood of a spent fuel assembly falling into the core and damaging all the fuel pins in two assemblies is sufficiently small that refueling inside containment is not a safety concern which requires immediate remedial action.

<sup>1/</sup> J. N. Singh, "Fuel Assembly Handling Accident Analysis," EG&G Idaho Technical Report RE-A-78-227, October 1978.

We have, however, conservatively calculated the potential radiological consequences of a fuel assembly drop onto the reactor core with the rupture of all the fuel pins in two fuel assemblies. We have also assumed for this postulated accident that the source term for both spent fuel assemblies is that given in Regulatory Guide 1.25. This is conservative because (1) these two assemblies should not have the power peaking factor and clad gap activity recommended in Regulatory Guide 1.25 and (2) the pool decontamination factor for inorganic iodine should be greater than that recommended in Regulatory Guide 1.25. The calculated potential radiological consequences at the EAB and low population zone for the complete rupture of fuel pins in two assemblies are twice the values given in Table 1. Because these potential consequences are within the guidelines of 10 CFR Part 100 using the conservative assumptions of Regulatory Guide 1.25, we have concluded that the potential consequences of this postulated accident are acceptable and no additional restrictions on fuel handling operations and plant operating procedures are needed.

The results of this analysis warranted an investigation of a similar accident in the spent fuel pool. For this, a drop of 2-1/2 feet was postulated and the analysis performed in the same manner as previously described. Results indicate that in this scenario damage to the missile or target is minimal. No fuel pins in either fuel assembly were calculated to be ruptured.

As discussed above, we have evaluated the licensee's analysis of the postulated FHAIC. After performing an independent analysis of the radiological consequences of a FHAIC to any individual located at the nearest exclusion boundary, we conclude that the doses for one assembly failure are appropriately within the guideline values of 10 CFR Part 100 and for failure of two assemblies are within the guideline values of 10 CFR Part 100 and are, therefore, acceptable. As discussed above, the implementation of the proposed TS will provide assurance that the consequences of a FHAIC will be appropriately within the guidelines of 10 CFR Part 100; therefore, the proposed TS are acceptable and do not provide a decrease in the margin of safety.

#### Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: November 7, 1979

Table 1

ASSUMPTIONS FOR AND POTENTIAL CONSEQUENCES OF THE POSTULATED  
FUEL HANDLING ACCIDENTS AT THE EXCLUSION AREA BOUNDARY  
FOR ARKANSAS NUCLEAR ONE UNIT 1

Assumptions:

Guidance in Regulatory  
Guide 1.25

Power Level 2620 Mwt

Fuel Exposure Time 3 years

Peaking factor 1.7

Equivalent Number of Assemblies damaged 1

Number of Assemblies in core 177

Charcoal Filters Iodine removal efficiency Organic and Elemental, Combined 50%

Decay time before moving fuel 72 hours

0-2 hours X/Q Value, Exclusion Area Boundary (ground level release)  $3.2 \times 10^{-4} \text{ sec/m}^3$

Doses, Rem

Thyroid      Whole Body

Exclusion Area Boundary (EAB )  
Consequences from Accidents  
Inside Containment      43      0.3

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-313ARKANSAS POWER & LIGHT COMPANYNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY  
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 44 to Facility Operating License No. DPR-51, issued to Arkansas Power & Light Company (the licensee), which revised the Technical Specifications for operation of Arkansas Nuclear One, Unit No. 1 (the facility) located in Pope County, Arkansas. The amendment is effective as of the date of issuance.

The amendment modifies the Technical Specifications to incorporate limiting conditions for operation, surveillance requirements and associated bases for the Reactor Building Purge Filtration System.

This application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4), an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

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For further details with respect to this action, see (1) the licensee's application for amendment dated March 28, 1977, (2) Amendment No. 44 to License No. DPR-51, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D. C. and at the Arkansas Polytechnic College, Russellville, Arkansas. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 7th day of November, 1979.

FOR THE NUCLEAR REGULATORY COMMISSION

*Morton B. Fairtile*

Morton B. Fairtile, Acting Chief  
Operating Reactors Branch #4  
Division of Operating Reactors