

JUN 12 1979

Docket No. 50-368

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

Dear Mr. Cavanaugh:

SUBJECT: ISSUANCE OF AMENDMENT NO. 12 TO FACILITY OPERATING LICENSE
NO. NPF-6 FOR ARKANSAS NUCLEAR ONE, UNIT 2

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 12 to Facility Operating License No. NPF-6 for the Arkansas Power and Light Company for the Arkansas Nuclear One, Unit 2 plant. The amendment modifies license No. NPF-6 as noted below, and is effective as of its date of issuance.

1. The Appendix A Technical Specifications are modified to include a Nuclear Software Expert as a member of the Plant Safety Committee.
2. A license condition has been modified by deleting the restrictions on making any changes to the core protection calculator system software.
3. One license condition has been deleted regarding implementation of redundant valve position indication in the control room.

We have determined that Amendment No. 12 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 Section 51.5(d)(4), that an environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

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Mr. William Cavanaugh III

- 2 -

JUN 12 1979

Copies of the license amendment, FEDERAL REGISTER Notice, and Safety Evaluation supporting Amendment No. 12 are enclosed.

Sincerely,

Original signed by
John F. Stolz

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

Enclosures:

1. Amendment No. 12 to Facility Operating License No. NPF-6
2. FEDERAL REGISTER Notice
3. Safety Evaluation Supporting Amendment No. 12

cc:
See Next page

*See previous yellow for previous concurrence

OFFICE	DPM:LWR #1	DPM:LWR #1	DOR/STS	DSS/ICB NA	DRM:LWR #1
SURNAME	EGH Eaton:pcm	LBEngle JSE	*DBrinkman	LBellatracch	JFStolz
DATE	05/3/79	06/11/79	03/30/79	05/...../79	06/11/79

Mr. William Cavanaugh III

- 2 -

Copies of the license amendment, FEDERAL REGISTER Notice, and Safety Evaluation supporting Amendment No. 11 are enclosed.

Sincerely,

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

Enclosures:

1. Amendment No. 11 to Facility
Operating License No. NPF-6
2. FEDERAL REGISTER Notice
3. Safety Evaluation Supporting
Amendment No. 11

cc:
See Next page

*See previous yellow for previous concurrence

OFFICE >	DPM:LWR #1	DPM:LWR #1	DOR/STS	DSS/ICB	DPM:LWR #1	
SURNAME >	EGH ton:pcm	LBEngle	*DBrinkman	LBellatracchi	JFStolz	
DATE >	04/ 9 /79	04/ /79	03/ 30 /79	04/ /79	04/ /79	

Mr. William Cavanaugh III

- 2 -

Copies of the license amendment, FEDERAL REGISTER Notice, and Safety Evaluation supporting Amendment No. 10 are enclosed.

Sincerely,

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

Enclosures:

1. Amendment No. 10 to Facility Operating License No. NPF-6
2. FEDERAL REGISTER Notice
3. Safety Evaluation Supporting Amendment No. 10

cc:
See Next page

OFFICE	DPM:LWR #1	DPM:LWR #1	DOR/STS	DSS/ICB	OELD	DPM:LWR #1
SURNAME	Edgerton:pcm	LEngle	DBrinkman	LBellatracch	CWoodhead	JFStolz
DATE	03/6 /79	03/39 /79	03/30 /79	03/ /79	03/ /79	03/ /79

cc: Mr. Daniel H. Williams
Manager, Licensing
Arkansas Power & Light Company
P. O. Box 551
Little Rock, Arkansas 72203

Philip K. Lyon, Esq.
House, Holms & Jewell
1550 Tower Building
Little Rock, Arkansas 72203

Mr. C. W. Reed, Project Engineer
Bechtel Power Corporation
San Francisco, California 94119

Mr. Fred Sernatinger, Project Manager
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Mr. Charles B. Brinkman, Manager
Washington Nuclear Operations
C-E Power Systems
Combustion Engineering, Inc.
4853 Cordell Avenue, Suite A-1
Bethesda, Maryland 20014

Honorable Ermil Grant
Acting County Judge of Pope County
Pope County Courthouse
Russellville, Arkansas 72801

Director, Bureau of Environmental
Health Services
4815 West Markham Street
Little Rock, Arkansas 72201

Attorney General
Justice Building
Little Rock, Arkansas 72201

Mr. Bruce Blanchard
Environmental Projects
Review
Department of the Interior
Room 4256
18th and C Street, N. W.
Washington, D. C. 20240

U. S. Environmental Protection
Agency
ATTN: Ms. F. Munter
Office of Federal Activities
Room W-535, Waterside Mall
401 M Street, S. W.
Washington, D. C. 20460

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ARKANSAS POWER AND LIGHT COMPANY

DOCKET NO. 50-368

ARKANSAS NUCLEAR ONE, UNIT 2

FACILITY OPERATING LICENSE

Amendment No. 12
License No. NPF-6

1. The Nuclear Regulatory Commission (the Commission) having found that:
 - A. The issuance of this license amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 changing the Technical Specifications as indicated in the attachment to this license and by amending Paragraphs 2.C.(2), 2.C.(3)(k) and 2.C.(3)(m) of Facility Operating License No. NPF-6 as follows. The second paragraph of 2.C.(2) has not changed.

2.C.(2) Technical Specifications

The Technical Specifications contained in Appendices A & B, as revised through Amendment No. 12 are hereby incorporated in license NPF-6. Arkansas Power and Light Company shall operate the facility in accordance with Technical Specifications.

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2.C.(3) Core Protection Calculator System (CPCS)
(k)

Items (1), (2) and (3) of paragraph 2.C.(3)(k) have been superceded by the following conditions. In addition, a copy of the startup report addressed by these conditions shall be submitted to the Director of the Division of Project Management in the Office of Nuclear Reactor Regulation.

(4) CPCS Position No. 19, Software Change Procedure Qualification

The licensee's response to items (1), (2), (3) and (4) as identified in the Summary Subsection of Section D.4.4.6 of Supplement No. 2 to the Safety Evaluation Report has been reviewed and approved. Therefore, these matters have been resolved and item (4) of Condition 2.C.(3)(k) is deleted.

2.C.(3)(m) Redundant Valve Position Indication

The condition specified in paragraph 2.C.(3)(m) has been resolved and is, therefore, deleted.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
John F. Stolz

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

Attachment:
Changes to the Technical
Specifications

Date of Issuance: JUN 12 1979

*See previous yellow for previous concurrences

OFFICE	DPM:LWR #1	DPM:LWR #1	STS/DOR	OELD	DPM:LWR #1
SURNAME	EGH:ston:pcm	LBEngle	*DBrinkman	*CWoodhead	JFStolz
DATE	05/3/79	06/11/79	03/30/79	03/30/79	06/11/79

2.C.(3) Core Protection Calculator System (CPCS)
(k)

Items (1), (2) and (3) of paragraph 2.C.(3)(k) have been superceded by the following conditions. In addition, a copy of the startup report addressed by these conditions shall be submitted to the Director of the Division of Project Management in the Office of Nuclear Reactor Regulation.

(4) CPCS Position No. 19, Software Change Procedure Qualification

The licensee's response to items (1), (2), (3) and (4) as identified in the Summary Subsection of Section D.4.4.6 of Supplement No. 2 to the Safety Evaluation Report has been reviewed and approved. Therefore, these matters have been resolved and item (4) of Condition 2.C.(3)(k) is deleted.

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

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

Attachment:
Changes to the Technical
Specifications

Date of Issuance:

*See previous yellow for previous concurrences

OFFICE >	DPM:LWR #1	DPM:LWR #1	STS/DOR	OELD	DPM:LWR #1	
SURNAME >	EGHyson:pcm	LBEngle	*DBrinkman	*CWoodhead	JFStolz	
DATE >	04/ 2 /79	04/ /79	03/ 30 /79	03/ 30 /79	04/ /79	

2.C.(3) Core Protection Calculator System (CPCS)
(k)

Items (1), (2) and (3) of paragraph 2.C.(3)(k) have been superceded by the following conditions. In addition, a copy of the startup report addressed by these conditions shall be submitted to the Director of the Division of Project Management in the Office of Nuclear Reactor Regulation.

(4) CPCS Position No. 19, Software Change Procedure Qualification

The licensee's response to items (1), (2), (3) and (4) as identified in the Summary Subsection of Section D.4.4.6 of Supplement No. 2 to the Safety Evaluation Report has been reviewed and approved. Therefore, these matters have been resolved and item (4) of Condition 2.C.(3)(k) is deleted.

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

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

Attachment:
Changes to the Technical
Specifications

Date of Issuance:

*CPM - OK with legal
form
2/30/79*

OFFICE ➤	DPM:LWR #1	DPM:LWR #1	STS/DOR	DSS/ICB	OELD	DPM:LWR #1
SURNAME ➤	ECHYton:pcm	LBEngle	DBrinkman	LBellatracchi	CWoodhead	JFStolz
DATE ➤	03/23/79	03/29/79	03/30/79	03/ /79	03/30/79	03/ /79

ATTACHMENT TO LICENSE AMENDMENT NO. 12

FACILITY OPERATING LICENSE NO. NPF-6

DOCKET NO. 50-368

Replace the following page of the Appendix "A" Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains a vertical line indicating the area of change. The corresponding overleaf page is also provided to maintain document completeness.

Pages

6-5

6-5a (added)

6-6

ADMINISTRATIVE CONTROLS

6.3 UNIT STAFF QUALIFICATIONS

6.3.1 Each member of the unit staff shall meet or exceed the minimum qualifications of ANSI N18.1-1971 for comparable positions, except for the Health Physics Supervisor who shall meet or exceed the qualifications of Regulatory Guide 1.8, September 1975.

6.4 TRAINING

6.4.1 A retraining and replacement training program for the unit staff shall be maintained under the direction of the General Manager and shall meet or exceed the requirements and recommendations of Section 5.5 of ANSI N18.1-1971 and Appendix "A" of 10 CFR Part 55.

6.4.2 A training program for the Fire Brigade shall be maintained under the direction of the General Manager and shall meet or exceed the requirements of Section 27 of the NFPA Code - 1975, except for Fire Brigade training sessions which shall be held at least quarterly.

6.5 REVIEW AND AUDIT

6.5.1 PLANT SAFETY COMMITTEE (PSC)

FUNCTION

6.5.1.1 The Plant Safety Committee shall function to advise the General Manager on all matters related to nuclear safety.

COMPOSITION

6.5.1.2 The Plant Safety Committee shall be composed of the:

Chairman:	Operations and Maintenance Manager
Member:	Operations Superintendent
Member:	Technical Analysis Superintendent
Member:	Maintenance Superintendent
Member:	Instrumentation & Controls Superintendent
Member:	Plant Analysis Superintendent
Member:	Health Physics Supervisor
Member:	Nuclear Software Expert*

The General Manager shall appoint in writing an acting chairman in the absence of the Operations and Maintenance Manager.

*See page 6-5a

ADMINISTRATIVE CONTROLS

*If one of the above members of the Plant Safety Committee meets the qualification requirements for this position, the requirement to have this member is satisfied. This membership may be filled by two appropriately qualified individuals who shall ballot with a single combined vote. Generic qualifications for this membership shall be as follows:

One Individual

The Nuclear Software Expert shall have as a minimum a Bachelor's degree in Science or Engineering, Nuclear preferred (in accordance with ANSI N18.1). In addition, he shall have a minimum of four years of technical experience, of which a minimum of two years shall be in Nuclear Engineering and a minimum of two years shall be in Software Engineering. (Software Engineering is that branch of science and technology which deals with the design and use of software. Software Engineering is a discipline directed to the production and modification of computer programs that are correct, efficient, flexible, maintainable, and understandable, in reasonable time spans, and at reasonable costs). The two years of technical experience in Software Engineering may be general software experience not necessarily related to the software of the Core Protection Calculator System. One of these two years of experience shall be with certified computer programs.

Two Individuals

One of the individuals shall meet the requirements of the Nuclear Engineering portion of the above. The second individual shall have a Bachelor of Science degree (digital computer speciality) and meet the Software Engineering requirements of the above.

The membership (the Nuclear Software Expert or the Digital Computer Specialist) shall be knowledgeable of the Core Protection Calculator System with regard to:

- a. The software modules, their interactions with each other and with the data base.
- b. The relationship between operator's module inputs and the trip variables.
- c. The relationship between sensor input signals and the trip variable.
- d. The design basis of the Core Protection Calculator System.
- e. The approved software change procedure and documentation requirements of a software change.
- f. The security of the computer memory and access procedures to the memory.

ADMINISTRATIVE CONTROLS

ALTERNATES

6.5.1.3 All alternate members shall be appointed in writing by the PSC Chairman to serve on a temporary basis; however, no more than two alternates shall participate as voting members in PSC activities at any one time.

MEETING FREQUENCY

6.5.1.4 The PSC shall meet at least once per calendar month and as convened by the PSC Chairman or his designated alternate.

QUORUM

6.5.1.5 The minimum quorum of the PCS necessary for the performance of the PSC responsibility and authority provisions of these technical specifications shall consist of the Chairman or his designated alternate and three members including alternates.

RESPONSIBILITIES

6.5.1.6 The Plant Safety Committee shall be responsible for:

- a. Review of 1) all procedures required by Specification 6.8 and changes thereto, 2) any other proposed procedures or changes thereto as determined by the General Manager to affect nuclear safety.
- b. Review of all proposed tests and experiments that affect nuclear safety.
- c. Review of all proposed changes to Appendix "A" Technical Specifications.
- d. Review of all proposed changes or modifications to unit systems or equipment that affect nuclear safety.
- e. Investigation of all violations of the Technical Specifications including the preparation and forwarding of reports covering evaluation and recommendations to prevent recurrence to the General Manager and to the Chairman of the Safety Review Committee.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-368

ARKANSAS POWER AND LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT 2

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 12 to Facility Operating License No. NPF-6 to Arkansas Power and Light Company for Operation of Arkansas Nuclear One, Unit 2 (the facility) located at the licensee's site in Pope County, Arkansas. The amended license is effective as of its date of issuance.

The amendment modifies a condition to Facility Operating License No. NPF-6 by removing the restrictions on the making of any software changes on the core protection calculator system based on Commission approval of the licensee's change procedures. Also, the Technical Specifications have been changed to include a Nuclear Software Expert as a member of the licensee's Plant Safety Committee. Finally, the amendment removes another condition regarding implementation of redundant valve position indication in the control room which has been verified to be completed in accordance with design modifications previously approved by the Commission.

The Commission has made appropriate findings as required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations in 10 CFR Chapter I, which are set forth in the amended license. We have concluded, that because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and

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does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration. The application for the license amendment complies with the standards and requirements of the Act and the Commission's regulations.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR Section 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.

For further details with respect to this action, see (1) Amendment No. 12 to Facility Operating License No. NPF-6 and (2) the Commission's related Safety Evaluation supporting Amendment No. 12 to License No. NPF-6. These items are available for public inspection at the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555 and the Arkansas Polytechnic College, Russellville, Arkansas 72801. A copy of items (1) and (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management, Office of Nuclear Reactor Regulation.

Dated at Bethesda, Maryland this *19th* day of *June* 1979.

Original signed by
John F. Stolz

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

*See previous yellow for previous concurrence

OFFICE >	DPM:LWR #1	DPM:LWR #1	OELD	DPM:LWR #1	
SURNAME >	EGD/ton:pcm	LBEngle	*CWoodhead	JFStolz	
DATE >	05/3/79	05/11/79	03/30/79	05/11/79	

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-368

ARKANSAS POWER AND LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT 2

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

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The amendment modifies ^aone condition to Facility Operating License No. NPF-6 by removing the restrictions on the making of any software changes on the core protection calculator system based on Commission approval of the licensee's change procedures. Also, the Technical Specifications have been changed to include a Nuclear Software Expert as a member of the licensee's Plant Safety Committee. Finally, the amendment removes ^{another}one condition regarding implementation of redundant valve position indication in the control room which has been verified to be completed in accordance with design modifications previously approved by the Commission.

The Commission has made appropriate findings as required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations in 10 CFR Chapter I, which are set forth in the amended license. We have concluded, that because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and

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DATE						

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR Section 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.

For further details with respect to this action, see (1) Amendment No. 11 to Facility Operating License No. NPF-6 and (2) the Commission's related Safety Evaluation supporting Amendment No. 11 to License No. NPF-6. These items are available for public inspection at the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555 and the Arkansas Polytechnic College, Russellville, Arkansas 72801. A copy of items (1) and (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management, Office of Nuclear Reactor Regulation.

Dated at Bethesda, Maryland this day of 1979.

John Angelo, Acting Chief
Light Water Reactors Branch No. 1
Division of Project Management

*See previous yellow for previous concurrence

OFFICE >	DPM:LWR #1	DPM:LWR #1	OELD	DPM:LWR #1		
SURNAME >	EGH J. S. on: pcm	LBEngle	*CWoodhead	JAngelo		
DATE >	04/ 2 /79	04/ /79	03/ 30 / 79	04/ /79		

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR Section 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.

For further details with respect to this action, see (1) Amendment No. 10 to Facility Operating License No. NPF-6 and (2) the Commission's related Safety Evaluation supporting Amendment No. 10 to License No. NPF-6. These items are available for public inspection at the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555 and the Arkansas Polytechnic College, Russellville, Arkansas 72801. A copy of items (1) and (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management, Office of Nuclear Reactor Regulation.

Dated at Bethesda, Maryland this day of 1979.

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

OFFICE	DPM:LWR #1	DPM:LWR #1	OELD	DPM:LWR #1		
SURNAME	EGaton:pcm	LBEngle	CWoodhead	JFStolz		
DATE	03/6 /79	03/29 /79	03/30 /79	03/ /79		

SAFETY EVALUATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 12
(ARKANSAS POWER AND LIGHT COMPANY)
DOCKET NO. 50-368

A. Redundant Valve Position Indication

In Supplement No. 2 to the Arkansas Nuclear One-Unit 2 (ANO-2) Safety Evaluation Report we stated that the Arkansas Power and Light Company (licensee) had committed to providing redundant Class IE valve position indication in the control room for recirculation valve 2CV-5628-2. The valve is located in the recirculation line from the engineered safety feature system pumps to the refueling water storage tank.

The licensee submitted schematic diagrams for implementation of the required design modifications and verified that the installed equipment would be environmentally and seismically qualified to maintain operability as required for this safety system.

Based on our review of the schematics and the licensee's commitments, we found the design modifications to be acceptable. However, the licensee stated that implementation of the design modifications could not be completed until after fuel loading because of procurement schedules. Therefore, in Amendment No. 1 to Operating License NPF-6, license condition 2.C.(3)(m) stipulated that design modifications for Valve 2C-5628-2 should be completed within six months from issuance on September 1, 1978, of Amendment No. 1.

On March 1, 1979, the licensee advised us that the implementation of the design modifications had been completed and by letter dated April 4, 1979, the Office of Inspection and Enforcement verified that the design modifications had been completed in accordance with license condition 2.C.(3)(m). Therefore, we find that the condition as stipulated in condition 2.C.(3)(m) has been fully satisfied, is no longer necessary and we conclude that Facility Operating License NPF-6 can be amended by removing license condition 2.C.(3)(m).

B. Core Protection Calculator System (CPCS) Position No. 19, Software Software Change Procedure Qualification

In Supplement No. 2 to the Arkansas Nuclear One-Unit 2 Safety Evaluation Report, we identified in the Summary Subsection of Section D.4.4.6 the outstanding items required for resolving the CPCS Position No. 19. License condition 2.C.(3)(k)(4) to Operating License NPF-6 stipulates:

"The licensee shall not make any changes to the CPCS software until the Commission has reviewed and approved the licensee's responses to items (1), (2), (3) and (4) as identified in the Summary Subsection of Section D.4.4.6 of Supplement No. 2 to the Safety Evaluation Report."

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Our review of items (1), (2), (3) and (4) and our bases for resolution of these items as specified in Position No. 19 are presented below:

Item 1; Position 19

The licensee committed to provide a revised Software Change Procedure to incorporate a Phase II test program consistent with the upgraded single channel test capability. The software change procedures, consisting of methodology and test case definition, are to be followed when specifying and implementing modifications to the quality assured core protection calculator/control element assembly calculator (CPC/CEAC) software and documentation. References 1 and 2 are the software change procedures submitted by the licensee in response to the commitment.

The revised Phase II test program is described in Reference 1. It consists of input sweep tests, Dynamic Software Verification Tests (DSVT) and live input-single parameter tests on the single channel system to verify the performance of the integrated software/hardware system. Input sweep tests are to include a minimum of 500 cases which cover the region of CPC operation over the full range of each CPC input sensor signals.

The DSVT cases will be selected with emphasis on testing the modified portions of the software. A complete set of test cases used for the ANO-2 Phase II testing are defined, and five of the most limiting design basis events are identified as DSVT test cases to be executed for all software modifications. Additional tests cases are to be selected with consideration of the nature and complexity of the software change that has been performed.

Five live input single parameter test cases are also identified for application to all software changes. The bases for generation of acceptance criteria and for satisfaction of these criteria are described.

We reviewed the software change procedures in References 1 and 2 and a meeting was held with the licensee on November 9, 1978 to discuss the procedures. While the meeting clarified many of our review concerns, a few concerns remained and these were formally defined to the applicant by means of a letter described in Reference 8. These concerns required additional clarification of the acceptance criteria stated in Reference 1.

Specifically the acceptance criteria for input sweep tests did not address a method for identifying design errors which may exist in the software. Also in our letter (Reference 8) to the licensee, we identified deficiencies in the verification for several of the change procedures presented in Reference 2.

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The licensee's response to our concerns regarding these procedures are presented in References 3 and 4. We have reviewed the revised procedures for the revisions and conclude that they resolve the concerns that we expressed in Reference 8. The method for examining tests results for evidence of software design deficiencies which lead to processing uncertainties larger than a specified acceptance level are addressed in an acceptable manner in Section 2.5.3.1 of Reference 3.

We also reviewed the Phase II test program presented in Reference 3 and we find it acceptable for general application to all software changes. However, for new projects and for extensive software modifications which are subject to staff review, the review of the Phase II test report will include an evaluation of the adequacy of the test cases selected. All of the test cases defined in Table 2.5.1 of Reference 3 will be required when extensive modifications to the software are conducted.

Item 2; Position 19

The licensee committed to provide a supplement to the Single Channel Qualification Test Report to demonstrate the acceptability of that system for Phase II testing.

The licensee has provided a Single Channel Qualification Test Report described in Reference 5 to demonstrate the acceptability of that system for execution of the test program required for software changes specified in Reference 3. Multi-variable transient capability was provided by the Dynamic Software Verification Test (DSVT) described in our Safety Evaluation Report, Supplement No. 2. In addition, the testing included demonstration of the CPC high power select option (neutron flux power versus core thermal power) and testing of interfaces between the CEAC, CPC, and operations module. All test results were compared to Fortran generated acceptance criteria and were within the acceptable range.

We also had our consultant audit the CPC Dynamic software Verification Field Test. The purpose of the field test was to evaluate the adequacy of the quality assurance procedures for transfer of software from the Single Channel Test Facility to the plant system (See Table D.1, Position 19, Part d, Supplement No. 2 to the Safety Evaluation Report). Our consultant's evaluation as reported in Reference 7 stated that the tests were conducted in accordance with the test procedures. The report also stated that the field test results were acceptable as they agreed with the expected test results stated in the test procedures. These same tests had also been successfully executed on the Single Channel Test Facility. Based on these results, we conclude that software can be successfully transferred from the Single Channel Test Facility to the Core Protection Calculator System at ANO-2.

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The staff has also concluded that the Single Channel Test Facility is an acceptable test system for testing of software changes as required by Position 19. This conclusion is based on the noise test capability described in Reference 3 and summarized in Item (4) below as well as the test capability which has been demonstrated and documented in Reference 5.

Item 3; Position 19

Software Consultant on Plant Safety Committee

In our assessment of software change procedures presented in Safety Evaluation Report, Supplement No. 2, we concluded that a qualified software consultant was required to serve on the Plant Safety Committee. We established this requirement to ensure that a person with the technical expertise required to understand the function and design of the Core Protection Calculator System would be a member of the Plant Safety Committee and would review safety questions regarding the system.

The licensee defined in Reference 13 a modification in the form of a proposed technical specification regarding the makeup of the Plant Safety Committee. We found the proposed technical specification unacceptable as it did not specify qualification requirements of the proposed member to the Committee. The licensee then revised the proposed technical specification in Reference 11 and it was found to be acceptable.

In Reference 11, the licensee specifies a software experience requirement as follows:

"One of these two years of experience shall be with certified computer programs."

In response to a request from our Office of Inspection and Enforcement regarding the interpretation of certified computer programs, we provide the following: Certified computer programs are those computer programs for which the validity of qualification test results has been attested to demonstrate conformance to the functional requirements of the computer program.

The licensee proposed a member of the plant staff, Mr. Thomas C. Cogburn, to be the Nuclear Engineer - Software Engineer for the plant safety committee. Mr. Cogburn's nuclear engineering qualifications are presented in Amendment No. 44 of the SAR. Mr. Cogburn's software engineering qualifications were presented to the staff at an August 31, 1978, meeting with the applicant. We have reviewed the candidate's qualifications in nuclear engineering and in software engineering and find them acceptable in terms of the requirements for the position.

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Based on our review and approval of the licensee's proposed technical specification for a software consultant, Technical Specification 6.5.1.2 has been modified to include a Nuclear Software Expert as a member of the Plant Safety Committee. Also, the generic qualifications for the membership on the Plant Safety Committee regarding the Nuclear Software Expert have been defined in Technical Specification 6.5.1.2, Administrative Controls.

Item 4; Position 19

The licensee committed to describe a noise test program, including synthetic noise testing on the single channel test facility, for use in the qualification of software changes.

Section 2.6 of Reference 3 provides for evaluation of all software changes for possible effects of the core protection calculator/control element assembly calculator (CPC/CEAC) System response due to plant process noise. The evaluation will initially be analytical in nature and will evaluate the potential for significant alteration to the noise response. The modified (CPC/CEAC) software is to be evaluated by testing for noise response if judged necessary as a result of the analytical evaluation.

The noise test program described by the licensee includes the use of simulated process inputs on the Single Channel Test Facility to provide the best available representation of actual plant noise, with the preferred source being FM tape recordings of in-plant noise on CPC/CEAC process inputs. The noise generation capability of the Single Channel Test Facility includes a 16-channel FM tape recorder and appropriate amplification equipment, a broadband noise generator for random noise synthesis. Acceptance criteria for noise response test results is based on the retention of conservatism in the trip variables and plant availability considerations.

The staff has reviewed the noise test capabilities and the approach to noise testing which has been described by the licensee and finds it generally acceptable for qualification of software changes. However, after careful evaluation, we found specific aspects of the process noise evaluation proposed by the licensee in Section 2.6 of Reference 3 were unacceptable. The licensee proposes that software changes to the CPC/CEAC system be analytically evaluated for their potential to significantly alter the systems' response to plant process noise. If the analytical evaluation indicates that the potential for significant alteration of the noise response exists, the modified software will be tested to verify that the altered noise response of the system is acceptable.

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Our concern is that any unexpected effect of software changes on noise response is more likely to go undetected since the random noise in plant simulator process inputs have been eliminated from the Phase II test program in favor of DSVT. Therefore, the staff will not accept an evaluation of noise response as sufficient evidence of acceptable noise response in those instances where new projects or extensive software modifications subject to staff review are involved. The staff requires inclusion of process noise tests in all test programs subject to staff review i.e., test programs related to changes which require staff review because of safety significance or because changes in technical specifications are involved. In summary, we did not find this aspect of the process noise evaluation procedures presented in Section 2.6 of Reference 3 acceptable. In order to make the process noise evaluation acceptable to the staff, we require that noise response tests be incorporated into the qualification test for safety-related software changes. However, the applicant may generate and qualify non-safety related changes to the software with the procedures specified by References 3 and 4.

In response to the staff's concerns regarding the adequacy of process noise evaluation procedures, the licensee has amended in Reference 7 Section 2.6 of Reference 3. We have reviewed this amendment and find it acceptable as the licensee commits to perform noise testing for all safety related program modifications and also when extensive modifications are made to the program.

Verification of Modified CPC/CEAC Fortran Simulation Code

During the course of our review of items 1, 2, 3 and 4 to Position 19 as discussed above, we determined that verification of a modified CPC/CEAC Fortran Simulation Code as identified in Reference 9 was an important step in the software change procedure. The licensee was therefore requested to discuss the verification process, the use of design codes, and the documentation and storage of results for later audit.

In Section 1.3.2.1 of Reference 3 the licensee presented a brief discussion which described the verification process and the documentation and storage of results. This information, coupled with the requirement in Appendix D. of Reference 4 that the system transient code be used to determine the required trip time for Phase II dynamic test cases, adequately addresses staff concerns on this issue. The staff therefore finds the verification methodology for changes to the CPC/CEAC Fortran Code acceptable.

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Summary On Position 19

We have reviewed References 3, 4, 5, 7, 12, 13 and 14 which address the outstanding concerns specified in Position 19 regarding qualification of software change procedures. We have concluded that Position 19 is resolved and the licensee may proceed with software changes in accordance with the approved documentation.

Therefore, we find that the condition 2.C.(3)(k)(4) has been fully satisfied, is no longer necessary, and we conclude that Facility Operating Licensing NPF-6 can be amended by removing license condition 2.C.(3)(k)(4).

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 and/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 or a significant decrease in any safety margin, it 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

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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.

Original Signed By:
Leon B. Engle

L. B. Engle, Project Manager
Light Water Reactors Branch No. 1
Division of Project Management

Original signed by
John F. Stolz

J. F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

Enclosure:
CPCS References
& Meeting Minutes

Date of Issuance: JUN 12 1979

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SURNAME	LBEngle:pcm	JFStolz				
DATE	06/11/79	06/11/79				

ENCLOSURE TO THE SAFETY EVALUATION

SUPPORTING AMENDMENT NO. 12

TO FACILITY OPERATING LICENSE NPF-6

REFERENCES

1. CEN-39(A)-P "CPC Protection Algorithm Software Change Procedure," September 22, 1978, Arkansas Nuclear One - Unit 2. (Proprietary)

CEN-39(A)-NP "CPC Protection Algorithm Software Change Procedure", September 22, 1978, Arkansas Nuclear One - Unit 2, Docket 50-368. Available in NRC PDR for inspection and copying for a fee.
2. CEN-39(A)-P, Supplement 1-P, "Core Protection Algorithm Software Change Procedure Supplement", September 29, 1978, Docket 50-368. Available in NRC PDR for inspection and copying for a fee.

CEN-39(A)-NP, Supplement 1-NP, "CPC Protection Algorithm Software Change Procedure Supplement", September 29, 1978, Docket 50-368. Available in NRC PDR for inspection and copying for a fee.
3. CEN-39(A)-P, Revision 02, "CPC Protection Algorithm Software Change Procedure", December 21, 1978 (Proprietary).

CEN-39(A)-NP, Revision 02, "CPC Protection Algorithm Software Change Procedure", December 21, 1978. Available in NRC PDR for inspection and copying for a fee.
4. CEN-39(A)-P, Supplement 1-P, Revision 01, "CPC Protection Algorithm Software Change Procedure Supplement" January 5, 1979. (Proprietary)

CEN-39(A)-NP Supplement 1-NP Revision 01, "CPC Protection Algorithm Software Change Procedure Supplement" January 5, 1979. Available in NRC PDR for inspection and copying for a fee.
5. CEN-71(A)-P, Supplement 1-P "Core Protection Calculatory Single Channel Qualification Test Report", September 22, 1978, Arkansas Nuclear One-Unit 2, Proprietary.

CEN-71(A)-NP, Supplement 1-NP, "Core Protection Calculator Single Channel Qualification Report", September 22, 1978, Docket 50-368. Available in NRC PDR for inspection and copying for a fee.
6. Letter, to J. F. Stolz, NRC, from Daniel H. Williams, Arkansas Power and Light Company, subject: "Arkansas Nuclear One-Unit 2, Docket No: 50-368, License NPF-6, CPC Documentation" Dated August 30, 1978. Available in NRC PDR for inspection and copying for a fee.

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7. Letter, to L. Beltracchi, NRC, from J. B. Pullock, ORNL, subject: Audit of "CPC Dynamic Software Verification Field Test Procedures" July 6, 1978. Available in NRC PDR for inspection and copying for a fee.
8. Letter, to William Cavanaugh III, Arkansas Power and Light Company, from J. F. Stolz, NRC, subject: "Core Protection Calculator System Position 19", dated December 13, 1978.
9. Letter, to William Cavanaugh III, Arkansas Power and Light Company, from John F. Stolz, NRC, subject: "Core Protection Calculator System Startup Test Audit" November 28, 1978. Available in NRC PDR for inspection and copying for a fee.
10. Letter, to Honorable Joseph M. Hendrie, Chairman, U. S. Nuclear Regulatory Commission, from Stephen Lawroski, Chairman, Advisory Committee on Reactor Safeguards, subject: "Report on Arkansas Nuclear One, Unit 2 Nuclear Power Plant", April 12, 1978.
11. Letter, to J. F. Stolz, NRC, From William Cavanaugh III, Arkansas Power and Light Company, "Supplemental Information to a Proposed Technical Specification", February 26, 1979.
12. CEN-55(A)-P "Phase II Design Qualification Test Procedure", June 24, 1977. Supplement 1-P, July 18, 1977.
13. Letter to J. F. Stolz, NRC, from William Cavanaugh III, Arkansas Power and Light Company, "Proposed Technical Specification", November 17, 1978.
14. Letter to J. F. Stolz, NRC, from David C. Trimble, Arkansas Power and Light Company, "CPC CEN 39" April 17, 1979.

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The licensee's response to our concerns regarding these procedures are presented in References 3 and 4. We have reviewed the revised procedures for the revisions and conclude that they resolve the concerns that we expressed in Reference 8. The method for examining tests results for evidence of software design deficiencies which lead to processing uncertainties larger than a specified acceptance level are addressed in an acceptable manner in Section 2.5.3.1 of Reference 3.

We also reviewed the Phase II test program presented in Reference 3 and we find it acceptable for general application to all software changes. However, for new projects and for extensive software modifications which are subject to staff review, the review of the Phase II test report will include an evaluation of the adequacy of the test cases selected. All of the test cases defined in Table 2.5.1 of Reference 3 will be required when extensive modifications to the software are conducted.

Item 2; Position 19

The licensee committed to provide a supplement to the Single Channel Qualification Test Report to demonstrate the acceptability of that system for Phase II testing.

The licensee has provided a Single Channel Qualification Test Report described in Reference 5 to demonstrate the acceptability of that system for execution of the test program required for software changes specified in Reference 3. Multi-variable transient capability was provided by the Dynamic Software Verification Test (DSVT) described in our Safety Evaluation Report, Supplement No. 2. In addition, the testing included demonstration of the CPC high power select option (neutron flux power versus core thermal power) and testing of interfaces between the CEAC, CPC, and operations module. All test results were compared to Fortran generated acceptance criteria and were within the acceptable range.

We also had our consultant audit the CPC Dynamic software Verification Field Test. The purpose of the field test was to evaluate the adequacy of the quality assurance procedures for transfer of software from the Single Channel Test Facility to the plant system (See Table D.1, Position 19, Part d, Supplement No. 2 to the Safety Evaluation Report). Our consultant's evaluation as reported in Reference 7 stated that the tests were conducted in accordance with the test procedures. The report also stated that the field test results were acceptable as they agreed with the expected test results stated in the test procedures. These same tests had also been successfully executed on the Single Channel Test Facility. Based on these results, we conclude that software can be successfully transferred from the Single Channel Test Facility to the Core Protection Calculator System at ANO-2.

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The staff has also concluded that the Single Channel Test Facility is an acceptable test system for testing of software changes as required by Position 19. This conclusion is based on the noise test capability described in Reference 3 and summarized in Item (4) below as well as the test capability which has been demonstrated and documented in Reference 5.

Item 3; Position 19

Software Consultant on Plant Safety Committee

In our assessment of software change procedures presented in Safety Evaluation Report, Supplement No. 2, we concluded that a qualified software consultant was required to serve on the Plant Safety Committee. We established this requirement to ensure that a person with the technical expertise required to understand the function and design of the Core Protection Calculator System would be a member of the Plant Safety Committee and would review safety questions regarding the system.

The licensee defined in Reference 13 a modification in the form of a proposed technical specification regarding the makeup of the Plant Safety Committee. We found the proposed technical specification unacceptable as it did not specify qualification requirements of the proposed member to the Committee. The licensee then revised the proposed technical specification in Reference 11 and it was found to be acceptable.

In Reference 11, the licensee specifies a software experience requirement as follows:

"One of these two years of experience shall be with certified computer programs."

In response to a request from our Office of Inspection and Enforcement regarding the interpretation of certified computer programs, we provide the following: Certified computer programs are those computer programs for which the validity of qualification test results has been attested to demonstrate conformance to the functional requirements of the computer program.

The licensee proposed a member of the plant staff, Mr. Thomas C. Cogburn, to be the Nuclear Engineer - Software Engineer for the plant safety committee. Mr. Cogburn's nuclear engineering qualifications are presented in Amendment No. 44 of the SAR. Mr. Cogburn's software engineering qualifications were presented to the staff at an August 31, 1978, meeting with the applicant. We have reviewed the candidate's qualifications in nuclear engineering and in software engineering and find them acceptable in terms of the requirements for the position.

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Based on our review and approval of the licensee's proposed technical specification for a software consultant, Technical Specification 6.5.1.2 has been modified to include a Nuclear Software Expert as a member of the Plant Safety Committee. Also, the generic qualifications for the membership on the Plant Safety Committee regarding the Nuclear Software Expert have been defined in Technical Specification 6.5.1.2, Administrative Controls.

Item 4; Position 19

The licensee committed to describe a noise test program, including synthetic noise testing on the single channel test facility, for use in the qualification of software changes.

Section 2.6 of Reference 3 provides for evaluation of all software changes for possible effects of the core protection calculator/control element assembly calculator (CPC/CEAC) System response due to plant process noise. The evaluation will initially be analytical in nature and will evaluate the potential for significant alteration to the noise response. The modified (CPC/CEAC) software is to be evaluated by testing for noise response if judged necessary as a result of the analytical evaluation.

The noise test program described by the licensee includes the use of simulated process inputs on the Single Channel Test Facility to provide the best available representation of actual plant noise, with the preferred source being FM tape recordings of in-plant noise on CPC/CEAC process inputs. The noise generation capability of the Single Channel Test Facility includes a 16-channel FM tape recorder and appropriate amplification equipment, a broadband noise generator for random noise synthesis. Acceptance criteria for noise response test results is based on the retention of conservatism in the trip variables and plant availability considerations.

The staff has reviewed the noise test capabilities and the approach to noise testing which has been described by the licensee and finds it generally acceptable for qualification of software changes. However, after careful evaluation, we found specific aspects of the process noise evaluation proposed by the licensee in Section 2.6 of Reference 3 are unacceptable. The licensee proposes that software changes to the CPC/CEAC system be analytically evaluated for their potential to significantly alter the systems's response to plant process noise. If the analytical evaluation indicates that the potential for significant alteration of the noise response exists, the modified software will be tested to verify that the altered noise response of the system is acceptable.

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Our concern is that any unexpected effect of software changes on noise response is more likely to go undetected since the random noise in plant simulator process inputs have been eliminated from the Phase II test program in favor of DSVT. Therefore, the staff will not accept an evaluation of noise response as sufficient evidence of acceptable noise response in those instances where new projects or extensive software modifications subject to staff review are involved. The staff requires inclusion of process noise tests in all test programs subject to staff review i.e., test programs related to changes which require staff review because of safety significance or because changes in technical specifications are involved. In summary, we did not find this aspect of the process noise evaluation procedures presented in Section 2.6 of Reference 3 acceptable. In order to make the process noise evaluation acceptable to the staff, we require that noise response tests be incorporated into the qualification test for safety-related software changes. However, the applicant may generate and qualify non-safety related changes to the software with the procedures specified by References 3 and 4.

In response to the staff's concerns regarding the adequacy of process noise evaluation procedures, the licensee has amended in Reference 7 Section 2.6 of Reference 3. We have reviewed this amendment and find it acceptable as the licensee commits to perform noise testing for all safety related program modifications and also when extensive modifications are made to the program.

Verification of Modified CPC/CEAC Fortran Simulation Code

During the course of our review of items 1, 2, 3 and 4 to Position 19 as discussed above, we determined that verification of a modified CPC/CEAC Fortran Simulation Code as identified in Reference 9 was an important step in the software change procedure. The licensee was therefore requested to discuss the verification process, the use of design codes, and the documentation and storage of results for later audit.

In Section 1.3.2.1 of Reference 3 the licensee presented a brief discussion which described the verification process and the documentation and storage of results. This information, coupled with the requirement in Appendix D. of Reference 4 that the system transient code be used to determine the required trip time for Phase II dynamic test cases, adequately addresses staff concerns on this issue. The staff therefore finds the verification methodology for changes to the CPC/CEAC Fortran Code acceptable.

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Summary On Position 19

We have reviewed References 3, 4, 5, 7, 12, 13 and 14 which address the outstanding concerns specified in Position 19 regarding qualification of software change procedures. We have concluded that Position 19 is resolved and the licensee may proceed with software changes in accordance with the approved documentation.

Therefore, we find that the condition 2.C.(3)(k)(4) has been fully satisfied, is no longer necessary, and we conclude that Facility Operating Licensing NPF-6 can be amended by removing license condition 2.C.(3)(k)(4).

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 §50.5(d)(4), that an environmental impact and/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 or a significant decrease in any safety margin, it 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

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Our review of items (1), (2), (3) and (4) and our bases for resolution of these items as specified in Position No. 19 are presented below:

Item 1; Position 19

The licensee committed to provide a revised Software Change Procedure to incorporate a Phase II test program consistent with the upgraded single channel test capability. The software change procedures, consisting of methodology and test case definition, are to be followed when specifying and implementing modifications to the quality assured core protection calculator/control element assembly calculator (CPC/CEAC) software and documentation. References 1 and 2 are the software change procedures submitted by the licensee in response to the commitment.

The revised Phase II test program is described in Reference 1. It consists of input sweep tests, Dynamic Software Verification Tests (DSVT) and live input-single parameter tests on the single channel system to verify the performance of the integrated software/hardware system. Input sweep tests are to include a minimum of 500 cases which cover the region of CPC operation over the full range of each CPC input sensor signals.

The DSVT cases will be selected with emphasis on testing the modified portions of the software. A complete set of test cases used for the ANO-2 Phase II testing are defined, and five of the most limiting design basis events are identified as DSVT test cases to be executed for all software modifications. Additional tests cases are to be selected with consideration of the nature and complexity of the software change that has been performed.

Five live input single parameter test cases are also identified for application to all software changes. The bases for generation of acceptance criteria and for satisfaction of these criteria are described.

We reviewed the software change procedures in References 1 and 2 and a meeting was held with the licensee on November 9, 1978 to discuss the procedures. While the meeting clarified many of our review concerns, a few concerns remained and these were formally defined to the applicant by means of a letter described in Reference 8. These concerns required additional clarification of the acceptance criteria stated in Reference 1.

Specifically the acceptance criteria for input sweep tests did not address a method for identifying design errors which may exist in the software. Also in our letter (Reference 8) to the licensee, we identified deficiencies in the verification for several of the change procedures presented in Reference 2.

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The staff has also concluded that the Single Channel Test Facility is an acceptable test system for testing of software changes as required by Position 19. This conclusion is based on the noise test capability described in Reference 3 and summarized in Item (4) below as well as the test capability which has been demonstrated and documented in Reference 5.

Item 3; Position 19

Software Consultant on Plant Safety Committee

In our assessment of software change procedures presented in Safety Evaluation Report, Supplement No. 2, we concluded that a qualified software consultant was required to serve on the Plant Safety Committee. We established this requirement to ensure that a person with the technical expertise required to understand the function and design of the Core Protection Calculatory System would be a member of the Plant Safety Committee and would review safety questions regarding the system.

The licensee defined in Reference 13 a modification in the form of a proposed technical specification regarding the makeup of the Plant Safety Committee. We found the proposed technical specification unacceptable as it did not specify qualification requirements of the proposed member to the Committee. The licensee then revised the proposed technical specification in Reference 11 and it was found to be acceptable.

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"One of these two years of experience shall be with certified computer programs."

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The licensee proposed a member of the plant staff, Mr. Thomas C. Cogburn, to be the Nuclear Engineer - Software Engineer for the plant safety committee. Mr. Cogburn's nuclear engineering qualifications are presented in Amendment No. 44 of the SAR. Mr. Cogburn's software engineering qualifications were presented to the staff at an August 31, 1978, meeting with the applicant. We have reviewed the candidate's qualifications in nuclear engineering and in software engineering and find them acceptable in terms of the requirements for the position.

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Based on our review and approval of the licensee's proposed technical specification for a software consultant, Technical Specification 6.5.1.2 has been modified to include Nuclear Software Expert as a member of the Plant Safety Committee. Also, the generic qualifications for the membership on the Plant Safety Committee regarding the Nuclear Software Expert have been defined in Technical Specification 6.5.1.2, Administrative Controls.

Item 4; Position 19

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The staff has reviewed the noise test capabilities and the approach to noise testing which has been described by the licensee and finds it generally acceptable for qualification of software changes. However, after careful evaluation, we found specific aspects of the process noise evaluation proposed by the licensee in Section 2.6 of Reference 3 are unacceptable. The licensee proposes that software changes to the CPC/CEAC system be analytically evaluated for their potential to significantly alter the systems's response to plant process noise. If the analytical evaluation indicates that the potential for significant alteration of the noise response exists, the modified software will be tested to verify that the altered noise response of the system is acceptable.

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SAFETY EVALUATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 12
(ARKANSAS POWER AND LIGHT COMPANY)
DOCKET NO. 50-368

A. Redundant Valve Position Indication

In Supplement No. 2 to the Arkansas Nuclear One-Unit 2 (ANO-2) Safety Evaluation Report we stated that the Arkansas Power and Light Company (licensee) had committed to providing redundant Class IE valve position indication in the control room for recirculation valve 2CV-5628-2. The valve is located in the recirculation line from the engineered safety feature system pumps to the refueling water storage tank.

The licensee submitted schematic diagrams for implementation of the required design modifications and verified that the installed equipment would be environmentally and seismically qualified to maintain operability as required for this safety system.

Based on our review of the schematics and the licensee's commitments, we found the design modifications to be acceptable. However, the licensee stated that implementation of the design modifications could not be completed until after fuel loading because of procurement schedules. Therefore, in Amendment No. 1 to Operating License NPF-6, license condition 2.C.(3)(m) stipulated that design modifications for Valve 2C-5628-2 should be completed within six months from issuance on September 1, 1978, of Amendment No. 1.

On March 1, 1979, the licensee advised us that the implementation of the design modifications had been completed and by letter dated April 4, 1979, the Office of Inspection and Enforcement verified that the design modifications had been completed in accordance with license condition 2.C.(3)(m). Therefore, we find that the condition as stipulated in condition 2.C.(3)(m) has been fully satisfied, is no longer necessary and we conclude that Facility Operating License NPF-6 can be amended by removing license condition 2.C.(3)(m).

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SAFETY EVALUATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 12
(ARKANSAS POWER AND LIGHT COMPANY)
DOCKET NO. 50-368

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In Supplement No. 2 to the Arkansas Nuclear One-Unit 2 (ANO-2) Safety Evaluation Report we stated that the Arkansas Power and Light Company (licensee) had committed to providing redundant Class IE valve position indication in the control room for recirculation valve 2CV-5628-2. The valve is located in the recirculation line from the engineered safety feature system pumps to the refueling water storage tank.

The licensee submitted schematic diagrams for implementation of the required design modifications and verified that the installed equipment would be environmentally and seismically qualified to maintain operability as required for this safety system.

Based on our review of the schematics and the licensee's commitments, we found the design modifications to be acceptable. However, the licensee stated that implementation of the design modifications could not be completed until after fuel loading because of procurement schedules. Therefore, in Amendment No. 7 to Operating License NPF-6, license condition 2.C.(3)(m) stipulated that design modifications for Valve 2C-5628-2 should be completed within six months from issuance of Amendment No. 1 on September 1, 1979.

On March 1, 1979, the licensee advised us that the implementation of the design modifications had been completed and by letter dated April 4, 1979, the Office of Inspection and Enforcement verified that the design modifications had been completed in accordance with license condition 2.C.(3)(m). Therefore, we find that the condition as stipulated in condition 2.C.(3)(m) has been fully satisfied, is no longer necessary and we conclude that Facility Operating License NPF-6 can be amended by removing license condition 2.C.(3)(m).

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Docket No. 50-368

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Docketing and Service Section
Office of the Secretary of the Commission

SUBJECT: NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE FOR
ARKANSAS NUCLEAR ONE, UNIT 2 - Amendment No. 12

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 (15) 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) No. 12 to ANO-2
- Other: _____

P.S. An extra copy of Amendment No. 12 enclosed for NRC PDR.

Enclosure:
As Stated

Office of Nuclear Reactor Regulation

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SURNAME →	6/19/79					
DATE →	EGHY1ton					

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-368

ARKANSAS POWER AND LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT 2

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 12 to Facility Operating License No. NPF-6 to Arkansas Power and Light Company for Operation of Arkansas Nuclear One, Unit 2 (the facility) located at the licensee's site in Pope County, Arkansas. The amended license is effective as of its date of issuance.

The amendment modifies a condition to Facility Operating License No. NPF-6 by removing the restrictions on the making of any software changes on the core protection calculator system based on Commission approval of the licensee's change procedures. Also, the Technical Specifications have been changed to include a Nuclear Software Expert as a member of the licensee's Plant Safety Committee. Finally, the amendment removes another condition regarding implementation of redundant valve position indication in the control room which has been verified to be completed in accordance with design modifications previously approved by the Commission.

The Commission has made appropriate findings as required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations in 10 CFR Chapter I, which are set forth in the amended license. We have concluded, that because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and

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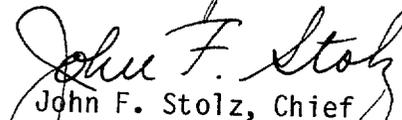
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does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration. The application for the license amendment complies with the standards and requirements of the Act and the Commission's regulations.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR Section 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.

For further details with respect to this action, see (1) Amendment No. 12 to Facility Operating License No. NPF-6 and (2) the Commission's related Safety Evaluation supporting Amendment No. 12 to License No. NPF-6. These items are available for public inspection at the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555 and the Arkansas Polytechnic College, Russellville, Arkansas 72801. A copy of items (1) and (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management, Office of Nuclear Reactor Regulation.

Dated at Bethesda, Maryland this 19th day of June 1979.


John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

ARKANSAS NUCLEAR ONE, UNIT 2 OPERATING LICENSE NO. NPF-6, AMENDMENT NO. 12
DATED: June 12, 1979

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