



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-4005**

August 27, 2003

Craig G. Anderson, Vice President,  
Operations  
Arkansas Nuclear One  
Entergy Operations, Inc.  
1448 S.R. 333  
Russellville, Arkansas 72801-0967

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 - NRC EXAMINATION  
REPORT 05000368/2003301

Dear Mr. Anderson:

On July 18, 2003, the U. S. Nuclear Regulatory Commission (NRC) completed an initial operator licensing examination at Arkansas Nuclear One, Unit 2. The enclosed report documents the examination findings, which were discussed on July 18, 2003, with Mr. Tom Mayfield and other members of your staff.

The examination included the evaluation of seven applicants for reactor operator licenses and seven applicants for senior operator licenses. We determined that all applicants satisfied the requirements of 10 CFR Part 55, and the appropriate licenses have been issued.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Anthony T. Gody, Chief  
Operations Branch  
Division of Reactor Safety

Dockets: 50-368  
Licenses: NPF-6

Entergy Operations, Inc.

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Enclosure:  
NRC Examination Report  
05000368/2003301

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**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket: 50-368

License: NPF-6

Report No.: 05000368/2003301

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Unit 2

Location: Junction of Hwy. 64W and Hwy. 333 South  
Russellville, Arkansas

Dates: July 11-18, 2003

Inspectors: P. Gage, Senior Operations Engineer, Operations Branch  
G. Johnston, Senior Operations Engineer, Operations Branch  
T. McKernon, Senior Operations Engineer, Operations Branch  
M. Murphy, Senior Operations Engineer, Operations Branch

Accompanying  
Personnel: J. Drake, Operations Engineer, Operations Branch

Approved By: Anthony T. Gody, Chief  
Operations Branch  
Division of Reactor Safety

## SUMMARY OF FINDINGS

ER 05000368/2003301; Entergy Operations, Inc.; July 11-18, 2003; Arkansas Nuclear One, Unit 2; Initial Operator Licensing Examination.

NRC examiners evaluated the competency of seven applicants for reactor operator licenses and seven senior operator licenses at Arkansas Nuclear One, Unit 2. The NRC and facility staff developed the examinations using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 8, Supplement 1. Licensee proctors administered the written examination to all applicants on July 11, 2003, in accordance with the instructions provided by the chief examiner. The NRC administered the operating tests July 14-18, 2003.

### **Cornerstone: Human Performance**

No findings of significance were identified (Section 40A4).

## Report Details

### 4. OTHER ACTIVITIES (OA)

#### 4OA4 Initial Operator License Examination

##### .1 Operator Knowledge and Performance

###### a. Examination Scope

On July 11, 2003, the licensee proctored the administration of the written examinations to all 14 applicants. The licensee staff graded the written examinations, analyzed the results, and presented their analysis to the NRC on July 18, 2003.

The NRC examination team administered the various portions of the operating examination to all 14 applicants on July 14-18, 2003. The seven applicants for reactor operators and the four senior operator upgrade applicants participated in two dynamic simulator scenarios. The three senior operator instant applicants participated in three dynamic simulator scenarios. The seven applicants for reactor operator and the three senior operator instant applicants participated in a control room and facilities walkthrough test consisting of ten system tasks. The four senior operator upgrade applicants participated in a control room and facilities walkthrough test consisting of five system tasks. All 14 applicants participated in an administrative test consisting of five administrative tasks.

###### b. Findings

All 14 of the applicants passed all parts of the examination. The applicants demonstrated good 3-way communications, alarm response, and peer checking. For the written examinations, the reactor operator applicants average score was 95 percent and ranged from 93 to 98 percent, the senior reactor operator applicants average score was 88 and ranged from 80 to 92 percent. The overall written examination average was 92 percent. The text of the examination questions may be accessed in the ADAMS system under the accession numbers noted in the attachment.

The licensee conducted a performance analysis for the written examinations, submitting them to the chief examiner on July 18, 2003. The analysis identified no common knowledge deficiency. No remediation training was determined to be necessary following the examinations. The licensee submitted post examination comments on two questions. One question requested that two answers be accepted as correct; and that another question be deleted. The licensee's rationale and the NRC resolution are contained in the attachment.

No findings of significance were identified.

.2 Initial Licensing Examination Development

The NRC and licensee staff developed the examinations in accordance with NUREG-1021, Revision 8, Supplement 1. Licensee facility training and operations staff involved in examination development were on a security agreement.

.2.1 Examination Outline and Examination Package

a. Examination Scope

The facility licensee submitted their portion of the operating examination outline on March 24, 2003. The chief examiner reviewed the submittal against the requirements of NUREG-1021, Revision 8, Supplement 1, and provided comments to the licensee. The facility licensee submitted the draft operating examination package on June 18, 2003. The chief examiner reviewed the draft submittal against the requirements of NUREG-1021, Revision 8, Supplement 1, and provided comments on the operating examination to the licensee on June 27, 2003. The NRC conducted an onsite validation of the operating and written examinations during the period of June 23-27, 2003. The licensee satisfactorily completed comment resolution on June 27, 2003.

b. Findings

Region IV approved the initial examination outline and advised the licensee to proceed with the operating examination development.

The examiners determined that the operating examination initially submitted by the licensee was within the range of acceptability expected for a proposed examination.

No findings of significance were identified.

.3 Simulation Facility Performance

a. Examination Scope

The examiners observed simulator performance with regard to plant fidelity during the examination validation and administration.

b. Findings

No findings of significance were identified.

.4 Examination Security

a. Examination Scope

The examiners reviewed examination security both during the onsite preparation week and examination administration week for compliance with NUREG-1021 requirements. Plans for simulator security and applicant control were reviewed and discussed with licensee personnel.

b. Findings

No findings of significance were identified.

4OA5 Management Meeting

.1 Exit Meetings

The chief examiner presented the examination results to Mr. Tom Mayfield, Training Manager, and other members of the licensee's management staff on July 18, 2003. The licensee acknowledged the findings presented.

The licensee did not identify as proprietary any information or materials examined during the examination.



## ATTACHMENT

### KEY POINTS OF CONTACT

#### Licensee

R. Byford, Supervisor, Operations Training  
R. Carey, Training, Unit 2  
T. Mayfield, Supervisor, Operations Training  
D. Sealock, Supervisor, Simulator Support

#### ADAMS DOCUMENTS REFERENCED

Accession No.: ML032320605 - Written examination for reactor and senior reactor operators

#### POST EXAMINATION COMMENTS

##### Question 18 (RO)

Comment: "In accordance with ANO Unit 2 Technical Specification Bases, extended operation with CEAs significantly inserted in the core may lead to perturbation in 1) local burnup, 2) peaking factors, and 3) available SHUTDOWN MARGIN. Local burnup will affect Azimuthal Power Tilt (selection A), peaking factors are used in CPCs to calculate the Axial Shape Index (selection D), and both Azimuthal Power Tilt and Axial Shape Index are used in CPCs to calculate DNBR (selection B). The correct answer by the answer key is selection C, Hot Channel Factors. The term Hot Channel Factors is not found in any of the technical Specification bases. It is recommended this question deleted from the exam due to multiple correct answers based upon ANO Unit 2 Technical Specifications and no ability to justify the correct answer listed on the exam key."

##### NRC Resolution:

The NRC concurs with the deletion of question 18. While the term "Hot Channel Factors" should be familiar to operators of nuclear reactors from basic training and understanding how the power distribution limits for the core are obtained, the term is not specifically mentioned in the Technical Specifications for ANO Unit 2. Question 18 was deleted.

##### Question 50 (RO); 55 (SRO)

Comment: "While this question came from ANO's NRC exam bank, there is a note at the bottom of the question in the bank that states accepted both A and B as answers on 2000 SRO & RO Exams by NRC. Needs to be revised before using on another exam. The fact that this question had not been revised by the exam developer during the exam validation week was missed. Following the 2000 SRO & RO exam, extensive research was done to determine the impact of the NRC Information Notice on training material. It was determined that there was no evidence to prove that the Condensate Cross Connect valve, 2CV-0742, is required to be opened during MFP operation to prevent condensate piping over pressurization (the correct answer by the answer key), therefore the training material was not changed. Currently the training material states a cross connect valve, 2CV-0742, in the common suction header to the Feedwater pumps allows all of the condensate sources to be connected to either Feedwater pump at all times, which is consistent with selection A, Equalize Condensate Flow. The question had not been revised

because ANO had not picked it from the exam bank to be used on an exam. It is requested to accept two correct answers: A and B for this exam. TEAR ANO-2003-317 has been initiated to revise the question in the exam bank."

NRC Resolution:

The NRC concurs with accepting both answer A, "Equalize Condensate Flow", and answer B, "Prevent Condensate piping over pressurization" for Question 50 on the RO Exam and 55 on the SRO exam. The net effect of equalizing condensate flow to all MFP suction would be to prevent an over pressurization condition that is the topic of NRC Information notice 86-106 "Feedwater line Break". Answers a and b would be accepted.