



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E LAMAR BLVD
ARLINGTON, TX 76011-4511

April 17, 2014

Mr. Jeremy Browning, Site Vice President
Arkansas Nuclear One
Entergy Operations, Inc.
1448 SR 333
Russellville, AR 72802-0967

**SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 - NRC EXAMINATION REPORT
05000368/2014301**

Dear Mr. Browning:

On February 27, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an initial operator license examination at Arkansas Nuclear One, Unit 2. The enclosed report documents the examination results and licensing decisions. The preliminary operating test results were discussed on February 14, 2014, with Mr. P. Williams, Operations Manager, Mr. R. Byford, Training Manager, and other members of your staff. A telephonic meeting was conducted on March 19, 2014, with Mr. R. Martin, Operations Training Superintendent, who was provided the NRC licensing decisions.

The examination included the evaluation of eight applicants for reactor operator licenses, three applicants for instant senior reactor operator licenses, and three applicants for upgrade senior reactor operator licenses. The license examiners determined that eleven of the applicants satisfied the requirements of 10 CFR Part 55. Ten licenses have been issued and one license is being held in abeyance by NRC Region IV until proposed license denials become final or resolution of any examination appeal. There were three post examination comments submitted by your staff. Enclosure 1 contains details of this report and Enclosure 2 summarizes post examination comment resolution.

No findings were identified during this examination.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures 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/

Vincent G. Gaddy, Chief
Operations Branch
Division of Reactor Safety

Docket: 50-368

License: NPF-6

Enclosure: 1. NRC Examination Report 05000368/2014301
 2. NRC Post Examination Comment Resolution

cc: Electronic Distribution for Arkansas Nuclear One

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000368

License: NPF-6

Report: 05000368/2014301

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Unit 2

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

Dates: February 10 – March 19, 2014

Inspectors: B. Larson, Chief Examiner, Senior Operations Engineer
S. Garchow, Senior Operations Engineer
G. Apper, Operations Engineer
T. Farina, Operations Engineer
D. Strickland, Operations Engineer

Approved By: Vincent G. Gaddy, Chief
Operations Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

ER 05000368/2014301; February 10 – March 19, 2014; Arkansas Nuclear One, Unit 2; Initial Operator Licensing Examination Report.

NRC examiners evaluated the competency of eight applicants for reactor operator licenses, three applicants for instant senior reactor operator licenses, and three applicants for upgrade senior reactor operator licenses at Arkansas Nuclear One, Unit 2.

The licensee developed the examinations using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1. The written examination was administered by the licensee on February 27, 2014. NRC examiners administered the operating test on February 10-14, 2014.

The examiners determined that eleven of the applicants satisfied the requirements of 10 CFR Part 55. Ten licenses have been issued and one license is being held in abeyance by NRC Region IV until proposed license denials become final or resolution of any examination appeal.

A. NRC-Identified and Self-Revealing Findings

None

B. Licensee-Identified Violations

None

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA5 Other Activities (Initial Operator License Examination)

.1 License Applications

a. Scope

NRC examiners reviewed all license applications submitted to ensure each applicant satisfied relevant license eligibility requirements. Examiners also audited three of the license applications in detail to confirm that they accurately reflected the subject applicant's qualifications. This audit focused on the applicant's experience and on-the-job training, including control manipulations that provided significant reactivity changes.

b. Findings

No findings were identified.

.2 Examination Development

a. Scope

The NRC developed the written examination outline and reviewed all other outlines, draft examination, and test submitted by the licensee against the requirements of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." The NRC examination team conducted an onsite validation of the operating test.

b. Findings

No findings were identified.

NRC examiners provided outline, draft examination, and post-validation comments to the licensee. The licensee satisfactorily completed comment resolution prior to examination administration.

NRC examiners determined that the written examinations (both Reactor Operator and Senior Reactor Operator portions) were outside of the acceptable quality range as identified in NUREG-1021. For the Reactor Operator examination, 28 questions (37.3 percent) were determined to be Unsatisfactory on draft examination submittal. For the Senior Reactor Operator examination, 12 questions (48 percent) were determined to be Unsatisfactory on draft examination submittal. For both examinations, significant effort was required by multiple examiners to revise the questions to a satisfactory rating. Due to the poor quality of the examinations submitted, administration of the written examinations was delayed for 3 weeks. Also for both examinations, the question flaws were spread across the spectrum of errors that are identified by examiners. Question

flaws included knowledge and abilities (K/A) mismatches, non-credible distractors, stem focus, minutia, backward logic, and cues.

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

.3 Operator Knowledge and Performance

a. Scope

The NRC examination team administered the various portions of the operating test to all applicants on February 10-14, 2014.

On February 27, 2014, the licensee proctored the administration of the written examination to all 14 applicants. The original written examination administration date was February 7, 2014, but was delayed 3 weeks due to the significant amount of rework required to obtain a satisfactory examination. The licensee staff graded the written examinations, analyzed the results, and presented their analysis to the NRC on March 4, 2014.

b. Findings

No findings were identified.

Twelve applicants passed the written examination and 13 applicants passed all parts of the operating test. The final written examination, final operating test, post examination analysis, and comments may be accessed in the ADAMS system under the accession numbers noted in the Supplemental Information attachment. (Public release of the final written examination has been delayed for 24 months from the date of administration at the request of the licensee.) There were three post examination comments submitted by the licensee. All the post examination comment recommendations were rejected by the NRC and no changes were made to the written examination answer key. (See Enclosure 2 for the question, licensee comment and recommendation, and the NRC resolution.)

The examination team noted the following generic weaknesses during administration of the operating test:

- (1) Simulator JPM S4: Shutdown EFW Train "A" with EFAS Signal Present. The applicants were expected to override 2P-7B EFW pump discharge and flow control valves in order to feed both SGs to 60 percent during a period of time where the SGs were cycling between EFAS actuation and clearing signals. Essentially all applicants' displayed unsatisfactory knowledge of system knowledge on how and when to override the valves. A wide variety of actions were observed.
- (2) Scenario 2, Event 1: Perform Red Train Proportional Heater test. Two of the four crews had confusion regarding the 0 output on PZR pressure controller

equating to 100 percent heater output. However, both crews were able to self-correct by discussing the issue amongst themselves.

- (3) Admin JPM A4 / A8: Review Emergency RWP. Several applicants miscalculated stay times because they used 10 CFR Part 20 exposure limits and not the RWP dose alarm setpoint.

Copies of all individual examination reports were sent to the facility for evaluation and determination of appropriate remedial training.

.4 Simulation Facility Performance

a. Scope

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

b. Findings

No findings were identified.

.5 Examination Security

a. Scope

The NRC examiners reviewed examination security during both the onsite validation week and examination administration week for compliance with 10 CFR 55.49 and NUREG-1021. Plans for simulator security and applicant control were reviewed and discussed with licensee personnel.

b. Findings

No findings were identified.

40A6 Meetings, Including Exit

Exit Meeting Summary

The chief examiner presented the preliminary operating test results to Mr. P. Williams, Operations Manager, Mr. R. Byford, Training Manager, and other members of the staff on February 14, 2014. A telephonic meeting was conducted on March 19, 2014, with Mr. R. Martin, Operations Training Superintendent, who was provided the NRC licensing decisions.

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

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

R. Byford, Training Manager
C. Simpson, Operations Training Superintendent
R. Martin, Operations Training Superintendent

NRC Personnel

B. Tindell, Senior Resident Inspector

ADAMS DOCUMENTS REFERENCED

Accession No. ML14104A841 - FINAL WRITTEN EXAM (Delayed Release for 24 Months)
Accession No. ML14104A845 - FINAL OPERATING TEST
Accession No. ML14104A845 - POST EXAM ANALYSIS AND COMMENTS

NRC Resolution of Arkansas Nuclear One, Unit 2 Post Written Examination Comments

Note: A complete text of the licensee's post examination analysis and comments can be found in ADAMS under Accession Number ML14104A845.

RO QUESTION # 15

Consider the following:

- Unit 2 is at 100% power
- Annunciator 2K01-F10, "2RS1 INVERTER TROUBLE" comes into alarm
- Annunciator 2K01-J10, "DIST PNL5 2RS1/2RS3 GROUND" comes into alarm
- 2RS-1, 120 Vital AC Bus, voltage is reading 0 volts on SPDS

As the RO you are asked by the CRS to verify status of ESFAS channels at Panel 2C03. Based on the above plant status, you expect _____.

- A. only Trip Path-1 status light to be out
- B. only Trip Path-2 status light to be out
- C. Trip Path-1 and Trip Path-3 status lights to be out
- D. Trip Path-2 and Trip Path-4 status lights to be out

Answer: C

LICENSEE COMMENT:

Question is too detailed for initial exam.

This question has a 79 percent failure rate. Six of eight RO's and five of six SRO's missed the question, and all chose "A". The correct answer is "C".

- The level of knowledge from memory is not what would be expected of a licensed operator. The status of the indicating lights on panel 2C-03 and/or 2C-23 is used along with other indications in conjunction with the Annunciator Corrective Actions Procedure to address operation and malfunctions within the ESFAS system. This question level of detail is beyond the job requirements (i.e., the question has a valid K/A, but as written, is not operational in content) as required by ES-401-9 note 4.
- This question relies upon the examinee to recall ESFAS system knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from memory) as required by ES-401-9 note 4 and thus is too much to expect an examinee to recall from memory.

- The status of ESFAS Trip Path lights on loss of power supply is not something operators would be expected to know without the benefit of procedural guidance or electrical diagram. In addition, one of the applicants commented during the exam debrief that they were unsure of which lights the question was referring.

LICENSEE RECOMMENDATION:

Recommend deleting the question from this exam.

NRC RESOLUTION:

From information and conditions given in the stem, the applicant should have been able to determine that the primary issue at hand is failure of 2RS-1. To identify the correct answer, the applicant must have knowledge that 2RS-1 powers the RED train (channel 1) components, and that there are 2 Trip Paths for the channel 1 Logic Matrix. With that knowledge, the applicant would be able to determine which Trip Path status light(s) are out. The NRC has concluded the applicants should know what 2RS-1 supplies, and should know that the conditions given in the stem would result in Trip Paths 1 and 3 status lights out. The NRC does not accept that this knowledge is too specific, or outside what the applicant should be able to recall from memory. In addition, it is noted that the licensee agreed that this question, as written, was acceptable for the RO written examination per specific guidance contained in the Examination Authorization Letter.

The NRC has concluded that there is no change to the answer key for this question.

RO QUESTION # 71

Consider the following:

- An annunciator is coming in and out of alarm, causing a distraction to the Control Room staff
- CRS has declared it a Nuisance Alarm
- Shift Manager has given permission to pull the annunciator card
- OP-1015.001, Conduct of Operations, Section 10.0, is being implemented

Concurrence from the _____ must be obtained to ensure that pulling the annunciator card has no effect on continued system operability and a(n) _____ is required to be installed on the pulled annunciator card stored inside the annunciator panel.

- A. System Engineer; Equipment Out-of-Service or Caution tag
- B. System Engineer; Work Incomplete or Temporary Services and Equipment tag
- C. Shift Technical Advisor; Equipment Out-of-Service or Caution tag
- D. Shift Technical Advisor; Work Incomplete or Temporary Services and Equipment tag

Answer: D

LICENSEE COMMENT:

Question is SRO knowledge.

This question has a 36 percent overall failure rate, but a 50 percent failure rate for RO examinees. Four of the eight RO's and one of six SRO's missed; five chose "C", one chose "A". The correct answer is "D".

- This question has SRO level question knowledge with respect to who would approve the removal of the annunciator card (license level mismatch not allowed by EN-401-9). This question asks about administrative procedural guidance on which position must give concurrence for pulling an annunciator card and what the administrative requirements are for labeling (tagging) the removed card for identification while stored. This question is not linked to the job requirements of an RO as required by ES-401-9 (i.e., this level of detail is not expected to be recalled from memory).
- The tagging requirements for a removed annunciator card as specified in OP-1015.001, Section 10.1 is ambiguous (stem 10.1.4.A: install appropriate tag on pulled card) and the type of tag would be decided by and directed by the CRS. Based on this information, both distractors "C" and "D" are correct based on both; CRS has the ability to direct the type of tag to be used (i.e., Caution Card, Temporary Equipment tag, Work Incomplete tag, etc...) and the lack of specific procedural guidance.

- During the exam debrief with the applicants, they stated that removing an annunciator from service is a SRO task not an RO task. The task standard is contained in the SRO qualification guide A2QC-SRO-QUAL (A2QC-SRO-QUAL, Rev. 17, page 35, step 3.1, 3.5, and 4.1). It is not contained in RO Qualification Card Guide (A2QC-RO-QUAL).

LICENSEE RECOMMENDATION:

Recommend deleting the question from this exam.

NRC RESOLUTION:

The licensee contends that the question is SRO level knowledge. The question requires the applicant to know two things; the first is that the Shift Technical Advisor (STA) performs the system operability determination, not the System Engineer. The second piece of knowledge is what type of tag should be installed on the pulled annunciator card. The NRC has concluded that per the Lesson Plan identified on the question's worksheet, ALSP-RO-OPSPR, knowledge of OP-1015.001, Conduct of Operations, and EN-OP-115, Conduct of Operations, is required for RO applicants. Enabling Objectives for these procedures includes the following:

- Define Annunciator, Nuisance
- Define Operable/Operability
- Describe the specific responsibilities and duties of the Shift Engineer/Shift Technical Advisor
- Describe the instructions related to nuisance alarms
- Describe the process for removing annunciators from service
- Describe the processes used to maintain Plant / System Configuration

In addition, a review of OP-1015.001, Conduct of Operations, Section 10.1, the NRC disagrees with the licensee about the ambiguity of step 10.1.4.A. The step clearly identifies that if an annunciator card is pulled, a Work Incomplete Tag or other generic identification tag on pulled card be installed. It is noted that answers "B" and "D" are the only answers that have Work Incomplete as part of the answer. In addition, answers "A" and "C" include an Equipment Out-of-Service or Caution Tag. The applicant should be able to disregard these two distractors because there are no Equipment Out of Service Tags, and a Caution Tag is a specific tag, not a generic tag as called for in the procedure. In addition, it is noted that the licensee agreed that this question, as written, was acceptable for the RO written examination per specific guidance contained in the Examination Authorization Letter.

The NRC has concluded that there is no change to the answer key for this question.

SRO QUESTION # 95

Consider the following:

- Unit 2 is operating at 100% power
- A Loss of Stator Water Cooling has occurred
- Main Turbine Generator (MTG) runback is in progress

The CRS would perform the Reactivity Brief as directed by _____ and the brief _____ commencement of boration or CEA insertion.

- A. COPD-032, Transient Conduct of Operations; can be performed after
- B. COPD-032, Transient Conduct of Operations; must be performed prior to
- C. COPD-030, ANO Reactivity Management Program; can be performed after
- D. COPD-030, ANO Reactivity Management Program; must be performed prior to

Answer: A

LICENSEE COMMENT:

Question had a 67 percent (4/6) failure rate.

This question has a 67 percent failure rate. Four of six SRO's missed, all chose "C". The correct answer is "A".

- Question has distractors that are partially correct (e.g., the applicant can make unstated assumptions that are not contradicted by stem) with is not allowed by EN-401-9.
- Question asks which procedure directs performance of a Reactivity Brief. The question gives conditions which infer a plant transient is in progress. In this situation COPD-032, Transient Conduct of Operations, (listed in answer "A") would be a valid document. However, COPD-030, ANO Reactivity Management Program, also contains Shift Manager responsibilities for performance of Reactivity Briefings during a Transient condition (refer to COPD-030, Revision 007, step 4.5, 11th bullet, page 10 of 59).

During the exam debrief with the applicants, the applicants that chose the incorrect answer stated that they interpreted the question as asking what procedure provides overall guidance for performing reactivity briefings.

LICENSEE RECOMMENDATION:

Recommend accepting two correct answers ("A" and "C") for this question.

NRC RESOLUTION:

The NRC has identified that COPD-032 contains guidance for briefing requirements during transients. Section 19.0, Reactivity Management, step 19.1, states "During transient conditions the requirements of ANO Reactivity Management Program (COPD-030) do not apply." The question stem clearly identifies a transient is in progress as it states "Main Turbine Generator (MTG) runback is in progress." As a result, the NRC has concluded that any distractor that identifies COPD-030 is incorrect. It is noted that during question development, the chief examiner had a discussion with the licensee on the possibility of COPD-030 also being a correct answer. The result of the discussion was that all parties agreed that step 19.1 of COPD-032 was sufficient to eliminate distractors "C" and "D." The NRC has determined that the question stem is not ambiguous; a transient is in progress and in accordance with COPD-032, Section 20, Transient Reactivity Briefs, step 20.3, it is not necessary to delay action for the reactivity brief. The reactivity brief can occur following initiation of the maneuver. Thus, answer "A" is the only correct answer. In addition, it is noted that the licensee agreed that this question, as written, was acceptable for the SRO written examination per specific guidance contained in the Examination Authorization Letter.

The NRC has concluded that there is no change to the answer key for this question.