



**ENTERGY**

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April 28, 2000

Mr. Steve McCrory  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 400  
Arlington, Texas 76011-8064

**SUBJECT: INITIAL EXAMINATION – Examination Grading and Analysis for ANO,  
Unit 2 (CE), (NRC Inspection Report – 00-301)**

Dear Mr. McCrory,

Enclosed are the examination materials for the Arkansas Nuclear One, Unit 2, Initial Examination administered on April 21, 2000. The materials include master copies of the examination for both Reactor Operator and Senior Reactor Operator with answer keys, signed exam coversheets, candidate answer sheets, seating chart, candidate questions and responses, examination item analysis and the Unit 2 Examination Security Agreement. They are tabbed within the folder as follows:

- Attachment 1 Graded Written Examination Coversheets/Answer Sheets and Unmarked Answer Sheets,
- Attachment 2 Master Copy of RO/SRO Exam and Answer Keys,
- Attachment 3 Applicants Questions and Replies by Proctors,
- Attachment 4 RO/SRO License Exam Changes Due to Analysis and License Exam Analysis Comments,
- Attachment 5 Unit 2 License Examination Seating Chart,
- Attachment 6 Completed form ES-403-1, "Written Examination Grading Quality Checklist",
- Attachment 7 Post Examination Analysis,
- Attachment 8 Unit 2 Examination Security Agreement.

Please call me at 501/858-6932 if you have any questions.

Sincerely,

Daniel R. Sealock  
Facility Representative  
Arkansas Nuclear One  
Supervisor, Simulator Training and Support.

## 2000 ANO - 2 NRC RO/SRO License Exam Changes Due to Analysis

**QID**      **No.**      **Analysis Results:**

0217      RO 59      **Discussion:**

SRO 27      **Answer 'B'** would also be correct. The conditions in the stem of the question indicate that turbine unloading is excessive and getting worse based upon the magnitude of the Tave/Tref mismatch and that Tref is continuing to drop while Tave is constant. Therefore, indication of Tref dropping in answer 'B', considering a constant Tave stated in the stem, is evidence that turbine unloading is excessive.

From post exam interviews with the candidates, if answer A was "none of the above", we feel that all candidates would have selected answer B. All candidates interviewed stated that during the exam they felt apprehensive because they believed that two correct answers were available.

During a downpower, the operators are trained and directed by procedure 2102.004, Power Operations Attachment H (see attachment) to lower turbine load to maintain Tref within 2°F of Tave. During a down power maneuver, as turbine load is reduced, Tref (which is calculated from turbine first stage pressure) would drop. Any turbine unloading rate that would cause the procedural limit on the Tave/Tref mismatch to be violated due to Tref being more than 2°F lower than Tave would be deemed to be excessive and would be stopped.

**Actions:**

The question will be revised prior to being used in the future. It will also be covered in the post exam review with all candidates.

ATTACHMENT H

RAPID POWER REDUCTION

This Attachment provides a list of major steps to be accomplished during rapid power reductions when the unit needs to be off-line within 30 to 60 minutes. The intent is to provide enough guidance to start the shutdown as quickly as possible and to minimize unnecessary steps that would be a distraction during rapid maneuvers. More detail is provided in the body of this procedure for slower (>60 minute) power reductions. If the unit needs to be off-line in less than 30 minutes, a Reactor trip is recommended. Tables are provided to track the rate of power reduction.

POWER	ACTION
	Pass out copies of this attachment to all Control Room Operators
	If any CEA RSPT is inoperable, refer to step 11.3
	Notify NLOs, Management, Dispatcher, Chemist & Reactor Engineer
	Commence borating ~15 (EOL) to 25 (BOL) gpm, adjust as needed
	Lower turbine load to maintain Tref within 2° of Tave
	Maintain ASI (PID 268) between -0.20 & +0.20 with group 6 or P
	Monitor power using CPC PID 177
85	Sample RCS for Iodine within 2 to 6 hours
60	Idle or secure one MFP
60-40	Secure both HDPS
50	Verify 2CV-0404 and 2CV-0464 closed
45	Secure third Condensate pump
40	Transfer electrical loads to S/U 3 or S/U 2
25	Start 2P-7B
25	Close 2CV-0400 and 2CV-0460
20	Trip the Reactor and GO TO SPTAS

TIME	TARGET POWER	ACTUAL POWER
T = 0	100%	
T + 5	87%	
T + 10	73%	
T + 15	60%	
T + 20	47%	
T + 25	33%	
T + 30	20%	

TIME	TARGET POWER	ACTUAL POWER
T = 0	100%	
T + 5	93%	
T + 10	87%	
T + 15	80%	
T + 20	73%	
T + 25	67%	
T + 30	60%	
T + 35	53%	
T + 40	47%	
T + 45	40%	
T + 50	33%	
T + 55	27%	
T + 60	20%	

**QID**      **No.**      **Analysis Results:**

226      RO 55      **Discussion:**

SRO 57      The answer to this question is found in a contingency action column of an Abnormal Operating Procedure. The Control Room Supervisor based on current plant conditions would direct this action and as such is not a knowledge required by the Reactor Operator.

**Actions:**

Based on the opinion of the post-exam review team this question will be deleted from the Reactor Operator examination since it is above the required knowledge level of a Reactor Operator. This question will be revised for use on any subsequent examinations.

**QID**      **No.**      **Analysis Results:**

0260      RO 10      **Discussion:**

SRO 39      Answer A is also correct. System Training Manual (STM) 2-20, Rev 4, Condensate System. Section 1.3, System Description reads as follows:

Various cross-connect lines from one train to the other. The cross-connect lines facilitate maintenance on components of the Condensate and Feedwater System, and balance flows to the Steam Generators through the two feedwater trains.

See attachment.

NRC IE Information Notice 86-106 was used as the reference for this question. The IE Notice discusses industry events which caused condensate piping overpressurization and provides recommendations to avoid these problems. The information provided in this IE Notice makes answer B correct.

**Actions:**

Based on the opinion of the post-exam review team that the STM supports Answer A and nothing but the IE Notice supports answer B, answer A will also be accepted. The question will be further evaluated and revised in the exam bank prior to use on any other exams. The STM will be reviewed and evaluated with reference to information in IE.

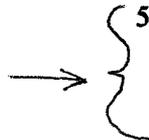
- Miscellaneous equipment dumps, drains, and vents
  - Startup & Blowdown DI Returns
- 5) The Condenser condenses main steam bypassed directly to the condenser by the Steam Dump and Bypass Control system.
  - 6) The Condensate and Feedwater Systems are designed to maintain unit operation during various abnormal conditions including:
    - One Main Feedwater pump out of service.
    - One Condensate pump out of service.
    - One Heater Drain pump out of service.
    - Extraction steam removed from a feedwater heater or an entire string of feedwater heaters.
    - Physically bypassing condensate around a set of L.P. feedwater heaters.

With one entire train of pumps and low pressure feedwater heaters out of service (extraction steam removed), the systems still supports 80% plant output

### 1.3 System Description

The Condensate system is composed of the following components: (Refer to the figure on page 28.)

1. Two Condensers (2E11A & 2E11B)
2. Four vertical Condensate pumps (2P2A, 2P2B, 2P2C, & 2P2D)
3. Five stages of low pressure feedwater heaters installed in each of two "strings" or trains (2E-7A&B, 2E-6A&B, 2E-5A&B, 2E-4A&B, and 2E-3A&B); each heater capable of 160% of normal flow,
4. Two Heater Drain pumps (2P8A & 2P8B); one per train
5. Various cross connect lines from one train to the other. The cross-connect lines facilitate maintenance on components of the Condensate and Feedwater systems, and balance flows to the Steam Generators through the two feedwater trains. The following is a description of the various cross-tie piping built into the condensate system:



- Main condensate suction lines from the condenser hotwells to the Condensate pumps,
- Condensate pumps discharge (2CS-3-1) (normally open)
- Upstream of 2E-3A/B (2CS-6-1) (normally open)
- Suction side of the Main Feed pumps (2CV-0742) (normally open)

# ANO – UNIT 2

## 2000 RO/SRO License Exam Analysis Comments

### SUMMARY

All questions were reviewed at the completion of the exam. Questions which arose during the exam, and after the exam review, have been analyzed. All questions which required a change or had a miss rate percentage of greater than or equal to 50% were evaluated and are included below. Exam analysis resulted in the deletion of one question to the RO Examination and the acceptance of two answers for two of the RO/SRO examination questions. No generic weaknesses of the licensed operator initial training program were indicated. Specific knowledge deficiencies will be corrected in the post examination review with all candidates.

### DETAILED ANALYSIS

QID	EXAM	% MISS	COMMENT
013	Both ROQ 91 SROQ 22	85.7	Two SRO's answered C, Two RO's answered C and two RO's answered D. This is a Basis question for the AOP and fundamentals question. Question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.
057	ROQ 3	50	Two RO's answered A. This question is a basic system knowledge question. The question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.
086	Both ROQ 1 SROQ 82	57.1	Two SRO's answered A, one SRO answered D and one RO answered A. The question is a Basis for the actions in the Abnormal Operating Procedure. This material was covered in the training for the License candidates. Question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.
145	SROQ 83	66.7	Two SRO's answered D. This requirement has been used at ANO for years and is valid. Question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.
214	Both ROQ 94 SROQ 55	57.1	One SRO answered A, one SRO answered C, one RO answered C and one RO answered B. This question checked the knowledge of the operators to what EDG trips are bypassed due to the SIAS signal. It is a good knowledge type question and the question is valid as written. This knowledge deficiency will be corrected in post exam review with all candidates.

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QID	EXAM	% MISS	COMMENT
215	Both ROQ 25 SROQ 72	57.1	Four candidates (2 SRO and 2 RO) chose D as their answer. The question is a simple knowledge question and requires NO changes. This knowledge deficiency will be corrected in post exam review with all candidates.
217	Both ROQ 59 SROQ 27	28.6	Two candidates missing this question chose B. <b>After investigation in the Post Exam, it was determined that B should be considered as correct also.</b> Please see the justification within this attachment. The question will be revised prior to being used in the future. It will also be covered in the post exam review with all candidates.
218	Both ROQ 36 SROQ 17	57.1	All candidates missing this question chose D. The Candidates did not realize that the CWP is generated by the CEAC. The PMS does supply a signal based upon rod position but not for the misalignment of the rods in the group. Question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.
226	Both ROQ 55 SROQ 57	57.1	In the Post Exam Review, it was determined that this question was outside the knowledge requirements of the RO candidates. The question is looking for a contingency action from an Abnormal Operating Procedure. This would be after multiple decision paths in the AOP. The RO's are not allowed or required to make AOP or EOP usage decisions within their job assignments and the question has been <b>DELETED</b> from the RO examination.
247	Both ROQ 16 SROQ 60	71.4	All Candidates missing this question chose D. The data in the stem provided an accurate description of a RCS voiding condition (PZR Level of 100% and RVLMS of 6 wet). Margin to Sat is low and should be restored by repressurizing the RCS. This will reduce the voiding and aid in restoring pressurizer level. Question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.
260	Both ROQ 10 SROQ 39	57.1	Three candidates missing this question chose D and one candidate chose A. <b>After investigation in the Post Exam, it was determined that A should be considered as correct also.</b> The System Training Manual states that the cross-connect functions to balance flow between the headers (STM-2-20 Rev. 4, page 3). The question will be revised prior to being used in the future. It will also be covered in the post exam review with all candidates. Training Evaluation Action Request (TEAR) 2000-356 was written to conduct training on the IE and incorporate it into the STM.

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QID	EXAM	% MISS	COMMENT
266	Both ROQ 73 SROQ 92	85.7	Two SRO's answered B, two RO's answered B and two RO's answered C. This is a higher Taxonomy level question on the Power Supplies and Interlocks on the Pressurizer Control Systems. On the loss of 2Y1, the loss of power to the Low Level Cutout results in the heaters de-energizing and cannot be regained for operation without restoring power to the low level cutout switch. The other actions listed will not result in the restoration of the heaters or pressure control without further actions being taken. Question is valid as written. This knowledge deficiency will be corrected in post exam review with all candidates.
272	ROQ 29	100	Three RO's answered C and one RO answered A. This question was to check the knowledge of procedural usage for accidents involving the dry cask storage being used at ANO. Question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.
286	SROQ 94	66.7	One SRO answered A and one SRO answered C. The question asked the candidate to calculate a Leak rate (15.6 gpm) and then to determine that the Excess RCS Leakage procedure will be used. The procedure guidance directs the operators to decrease RCS pressure to minimize the Delta-P by lowering RCS pressure to 100 psia above the minimum to operate the RCPs. The question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.
305	SROQ 97	66.7	Both candidates missing this question chose C. This question determined if the candidate knew that the rod misalignment was dependent upon the plant conditions (at power or in start up). The actions from the procedure are based on the reg groups configurations at the time of the misalignment. The question is valid as written, this knowledge deficiency will be corrected in post exam review with all candidates.