



Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

July 29, 2009

10 CFR 55.40

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U.S. Nuclear Regulatory Commission  
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Browns Ferry Nuclear Plant  
Facility Operating License Nos. DPR-33, DPR-52, and DPR-68  
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **REACTOR OPERATOR (RO) AND SENIOR REACTOR OPERATOR  
(SRO) INITIAL LICENSE WRITTEN EXAMINATIONS - POST  
EXAMINATION RESPONSE**

Mr. Widmann

TVA administered the final NRC Written Examination for the RO and SRO HLT Class 0801 on July 22, 2009. Please find enclosed, the supporting documentation required by Section ES-501 of NUREG 1021, Post Examination Activities. The enclosure content listing is provided at the end of this letter.

The results were three Senior Reactor Operator (SRO) Candidates passed the examination with overall scores ranging from 89 percent to 92 percent and four of six Reactor Operator (RO) Candidates passed the RO portion of the exam with scores ranging from 89 percent to 90.6 percent. Two Candidates failed the RO portion of the written exam with scores of 78.6 percent and 76 percent. The SRO scores on the RO portion of the examination ranged from 90.6 percent to 93.3 percent.

Analysis of the RO portion of the examination indicated five questions, numbers 18, 37, 59, 62, and 68, with a greater than 50 percent failure rate. Analysis of the SRO portion of the examination indicates questions 78 and 96 have a greater than 50 percent failure rate. Additionally, there were specific comments posed by the candidates during the post-examination review.

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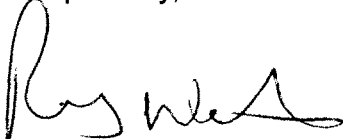
Subsequent detailed analysis of high miss-rate questions and those identified during post-exam review indicates potential issues with four questions. There are two questions in the package that TVA believes have two correct answers. There are two questions in the package that may have job-link issues. TVA has submitted these two questions for deletion.

The results of this analysis, where applicable, will be forwarded to the HLT Supervisor for potential inclusion in the appropriate training material.

The enclosures to this letter are considered by TVA to be of a personal nature and, as such, are to be withheld from public disclosure in accordance with 10 CFR 2.390(a)(6).

If you have any questions or comments, please telephone Mr. Brian P. Stetson at (256) 729-7039.

Respectfully,



R. G. West  
Vice President

Enclosures:

- Enclosure 1 - Form ES-403-1, Written Examination Grading Quality Check
- Enclosure 2 - Graded Written Examinations (I.E., Each Applicant's Original Answer and Examination Cover Sheets) Plus A Clean Copy of Each Applicant's Answer Sheet
- Enclosure 3 - Master Examination(s) Excerpt Annotated to Indicate Any Changes Made While Administering the Examination – No Changes Made While Grading
- Enclosure 4 - Questions Asked By and Answers Given to the Applicants During the Written Examination
- Enclosure 5 - Substantive Comments Made By the Applicants Following the Written Examination

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Enclosure 6 - Exam Seating Chart

Enclosure 7 - Results of Any Written Examination Performance Analysis  
That Was Performed, With Recommended Substantive  
Changes

**ENCLOSURE 1**

**BROWNS FERRY NUCLEAR PLANT (BFN)  
UNITS 1, 2, AND 3**

**REACTOR OPERATOR (RO) AND SENIOR REACTOR OPERATOR (SRO) INITIAL  
LICENSE WRITTEN EXAMINATION - POST EXAMINATION RESPONSE**

**FORM ES-403-1, WRITTEN EXAMINATION GRADING QUALITY CHECK**

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**(SEE ATTACHED)**

## Examination Outline Cross-reference:

295038 High Off-site Release Rate / 9

**EK1.03** (10CFR 55.41.10)

Knowledge of the operational implications of the following concepts as they apply to HIGH OFF-SITE RELEASE RATE:

- Meteorological effects on off-site release

Level	RO	SRO
Tier #	1	—
Group #	1	—
K/A #	295038EK1.03	
Importance Rating	2.8	—

Proposed Question: **# 18**

A General Emergency is declared due to a valid Wide Range Gaseous Rad Monitor (WRGERMS) reading. The current meteorological data is:

- 91 meter wind direction: 120 degrees
- 46 meter wind direction: 115 degrees

Which ONE of the following identifies the correct data point to use for this release **AND** the wind direction?

- A. (1) 91  
(2) wind is blowing from the Southeast
- B. (1) 46  
(2) wind is blowing from the Southeast
- C. (1) 91  
(2) wind is blowing from the Northwest
- D. (1) 46  
(2) wind is blowing from the Northwest

## Proposed Answer:

**A**

Post-Exam **Delete the question.**  
Evaluation  
Recommen-  
dation:

*Directions CHALLENGES*

Challenge  
Issue:

**Answer Key Incorrect / Stem Clarity - The stem requests the candidate demonstrate knowledge of meteorological implications during emergency conditions. The stem asks for information that is not a part of a ROs normal job responsibility. Part (1) asks information on the correct data point to collect data from [46m or 91m]. This information is normally collected by RP personnel per EPIP-13, "Dose Assessment," (See excerpt). If SPDS is unavailable, (see excerpt), operations could be asked specifically what parameters to monitor/report. With SPDS out of service, there is NO information available inside the Control Room to support data collection for Wind Direction.**

BROWNS FERRY

DOSE ASSESSMENT

EPIP-13

## 3.6.3 Stack Meteorological Data

3.6.3.1 For stack releases record measurements at the 91 meter reading.

3.6.3.2 The default value for stability class with no met data available is "D" for stack releases.

3.6.3.3 The default value for wind speed with no met data available is 4.0 meters/second for the stack.

3.4 Determination of Noble Gas Release Rate in  $\mu\text{Ci}/\text{second}$  (Step 3 of Appendix A and B)

## 3.4.1 Stack Noble Gas Release Rate

3.4.1.4 If SPDS is unavailable, notify Operations personnel on the affected unit to gain the information utilizing control room instrumentation, or if unavailable, notify the Shift Manager/Site Emergency Director that TI-67, "Determination of Stack and Hardened Wetwell Vent Release Rates" (backup method), procedure must be performed by RP and Chemistry personnel.

**The ROs do normally collect and record meteorological data per 1-SR-2, "Instrument Checks and Observations," based on TRM 3.3.7 requirements (See excerpt). This information is collected on all three levels (10m, 46m and 91m), making it non-specific to the requirements of an emergency assessment.**

BFN Unit 1	Instrument Checks and Observations	1-SR-2 Rev. 0019 Page 69 of 173
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Attachment 2  
(Page 49 of 96)

## Surveillance Procedure Data Package - Modes 1, 2, &amp; 3

TABLE 1.48 METEOROLOGICAL INSTRUMENTATION				DAY SHIFT		WEEK		to	
APPLICABILITY				AT ALL TIMES (Note 2)					
Criteria Source				TSR 3.3.7.1					
LOCATION				ICS Computer (Note 1)			Review Initials		
	WIND DIRECTION			WIND SPEED					
	91M	46M	10M	91M	46M	10M	UO	Unit Supv	
Friday									
Saturday									
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									

**The need for this information during emergency conditions is the responsibility/function of RP or an SRO if requested by RP, based on the following:**

**1) Per supplied "Guidance for SRO-only Questions," Rev 0, page 5 of 19, (see excerpt) part (1) would be considered SRO knowledge only.**

<p>Does the question involve one or more of the following for Tech Specs, Technical Requirements, and/or Offsite Dose Calculation Manual?</p> <ul style="list-style-type: none"> <li>• Application of required actions (Section 3) and surveillance requirements (Section 4) in accordance with rules of application requirements (Section 1) <b><u>NO</u></b></li> <li>• Applications of generic LCO requirements (LCO 3.0.1 thru 3.0.7 and LCO 4.0.1 thru 4.0.7) <b><u>NO</u></b></li> <li>• Knowledge of tech spec bases that is required to analyze tech spec required actions and terminology <b><u>YES</u></b></li> </ul>	<p>YES → SRO —only question</p>
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Meteorological Monitoring Instrumentation  
B 3.3.7

TR 3.3 INSTRUMENTATION

TR 3.3.7 Meteorological Monitoring Instrumentation

BASES

BACKGROUND

A complete description of past meteorological conditions at BFN and the surrounding area is located in the FSAR. The meteorology of the Browns Ferry site provides generally favorable atmospheric conditions for transport and dispersion of plant emissions.

An operational meteorological measurement program ensures that sufficient data is available for estimating potential radiation dose to the public as a result of routine or accidental release of radioactive materials to the atmosphere. A 91 meter tower with supporting meteorological instrumentation is located within the BFN site boundary to satisfy this objective.

***However, none of this information is used during emergency conditions, making this NOT within the scope of a RO job function.***

***Thus, there are NO correct answers.***

Candidate performance: 3 of 9 selected "C", 1 selected "B", and 5 selected "A"

Explanation:

A. INCORRECT: Part 1= correct, Per EPIP-13, attachment A Met data is collected from the 91 meter point. This is a stack release. (WRGERMS = stack) This information is collected and documented by RP personnel, or if SPDS were non-operational, a request of Operations. However there is NO additional instrumentation within the Control Room that could be used to assess Wind Direction if SPDS were to be NON-OPERATIONAL. Part 2 = correct - Per EPIP-13, Attachment A, wind "**from**" is correct. Also the RO does collect Meteorological data per 1-SR-2, making this portion not specifically a function of the RO, but within the knowledge range of a RO.

B. INCORRECT: See above.

C. INCORRECT: See above.

D. INCORRECT: See above.

Technical Reference(s): EPIP-13 Rev 38, (Attach if not previously provided)  
1-SR-2 Rev 19 (Including version / revision number)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: (As available)

Question Source:

Bank #  
Modified Bank #

New X

(Note changes or attach parent)

Question History:

Last NRC Exam

*(Optional - Questions validated at the facility since 10/95 will generally undergo less rigorous review by the NRC; failure to provide the information will necessitate a detailed review of every question.)*

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43

Comments:



## Examination Outline Cross-reference:

295029 High Suppression Pool Wtr Lvl / 5

**EA1.04** (10CFR 55.41.7)

Ability to operate and/or monitor the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL:

- RCIC: Plant-Specific

Level	RO	SRO
Tier #	1	---
Group #	2	---
K/A #	295029EA1.04	
Importance Rating	3.4	---

## Proposed Question: # 26

During a Unit 2 startup, with power ascension at 20% Reactor Power, a rapid loss of condenser vacuum forces the crew to insert a manual Scram. The following plant conditions exist:

- Reactor Water Level initially lowered to 0 inches and is currently being controlled (+) 2 to (+) 51 inches with RCIC **AND** CRD
- The MSRVs are being used to control Reactor Pressure **AND** HPCI was started in pressure control mode
- Suppression Pool Water Level reaches (+) 7 inches

Which ONE of the following predicts the current status of RCIC **AND** the required operator action in accordance with 2-EOI-1, "RPV Control?"

RCIC Suction (1) **AND** the required operator action in accordance with 2-EOI-1, is to (2).

- A. (1) is aligned to the CST  
(2) continue RCIC operation in the current configuration.
- B. (1) is aligned to the CST  
(2) manually swap RCIC suction path.
- C. (1) automatically swaps to the Suppression Pool  
(2) continue RCIC operation in the current configuration.
- D. (1) automatically swaps to the Suppression Pool  
(2) manually swap RCIC suction path.

## Proposed Answer:

**A**

Post-Exam Evaluation      Accept both "A" and "B" responses  
Recommendation:

## Challenge Issue:

**Answer Key Incorrect / Stem Clarity - The stem requests the candidate demonstrate knowledge of RCIC operation in accordance with 2-EOI-1. 2-EOI-1 Flowchart step RC/L-4 directs RCIC operation [with CST suction if possible]. However, 2-EOI APPENDIX-5C, INJECTION SYSTEM LINEUP RCIC, the controlling document for placing RCIC in level control, gives the option in step 11 (see excerpt below) to shift suctions to the Suppression Pool if desired.**

11. IF ..... It is desired to align RCIC suction to the Suppression Pool,

THEN ... PERFORM the following:

- a. OPEN 2-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE. \_\_\_\_\_
- b. OPEN 2-FCV-71-18, RCIC SUPPR POOL OUTBD SUCT VALVE. \_\_\_\_\_
- c. WHEN ... 2-FCV-71-17, RCIC SUPPR POOL INBD SUCT VALVE, and 2-FCV-71-18, RCIC SUPPR POOL OUTBD SUCT VALVE, are fully open,  
THEN ... VERIFY CLOSED 2-FCV-71-19, RCIC CST SUCTION VALVE. \_\_\_\_\_

**The stem did not clarify what portion of 2-EOI-1 to reference [flowchart step RC/L-4 or Appendix 5C]; only that 2-EOI-1 is the controlling document. Also, NO CST level is provided in the stem, forcing the candidate to make an assumption. With Suppression Pool level requiring a very narrow band of control, the candidate(s) thought it was a prudent decision to lower level in the Suppression Pool; thus applying the portion of Appendix 5C step 11 (if desired to align RCIC suction to the Suppression Pool).**

**Therefore, with the option to shift suctions in Appendix 5C (also within a 2-EOI-1 document) taken in conjunction with the fact that we are now in 2-EOI-2 on High Suppression Pool level, it would be considered a valid operational action that protects containment integrity. Additionally having OI-71 Precaution & Limitation knowledge supports the fact that at +7 "Suppression Pool Level, a suction swap should be performed. Thus, there are TWO correct answers: "A" and "B".**

Candidate performance: 3 of 9 selected "B", 6 selected "A"

## Explanation:

**A. CORRECT:** Part 1 correct – Normal suction lineup for RCIC is to the CST and there is no automatic suction swap. Part 2 correct - RCIC injection in the EOIs is directed to be "with CST Suction if possible" (see procedure excerpt).

**B. CORRECT:** Part 1 correct – Normal suction lineup for RCIC is to the CST and there is no automatic suction swap. Part 2 correct – Appendix 5C allows for shifting suction paths. The stem only addresses IAW 2-EOI-1 With Appendix 5C being a part of 2-EOI-1, (see procedure excerpt) shifting suction paths is permitted, making this an acceptable answer also. With the Suppression Pool outside its normal operating band, the candidate could conceive that it is required to lower level, thus applying the portion of Appendix 5C step 11 (if desired to align RCIC suction to the Suppression Pool).

C. INCORRECT: Part 1 incorrect – Plausibility based on the overwhelming similarities between the HPCI and RCIC Systems; and the frequently confused differences. HPCI automatically swaps suction to the Suppression Pool at +5.25 inches. Part 2 correct - RCIC injection in the EOIs is directed to be “with CST Suction if possible” (see procedure excerpt).

D. INCORRECT: Parts 1 is incorrect and 2 correct as explained in “B”.

Technical Reference(s): 2-OI-71 Rev 57, 2-EOI-1 Rev 12, 2-EOI-1 Appendix-5C Rev 4 (Attach if not previously provided)

OPL171.040 Rev 22 / 042 Rev 19 (Including version / revision number)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: V.B.6, V.B.9, V.B.11, V.B.12 (As available)

Question Source:

Bank #

Modified Bank #

0610 Audit # 64

(Note changes or attach parent)

New

Question History:

Last NRC Exam

*(Optional - Questions validated at the facility since 10/95 will generally undergo less rigorous review by the NRC; failure to provide the information will necessitate a detailed review of every question.)*

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis **X**

10 CFR Part 55 Content: 55.41 **X**  
55.43

Comments:

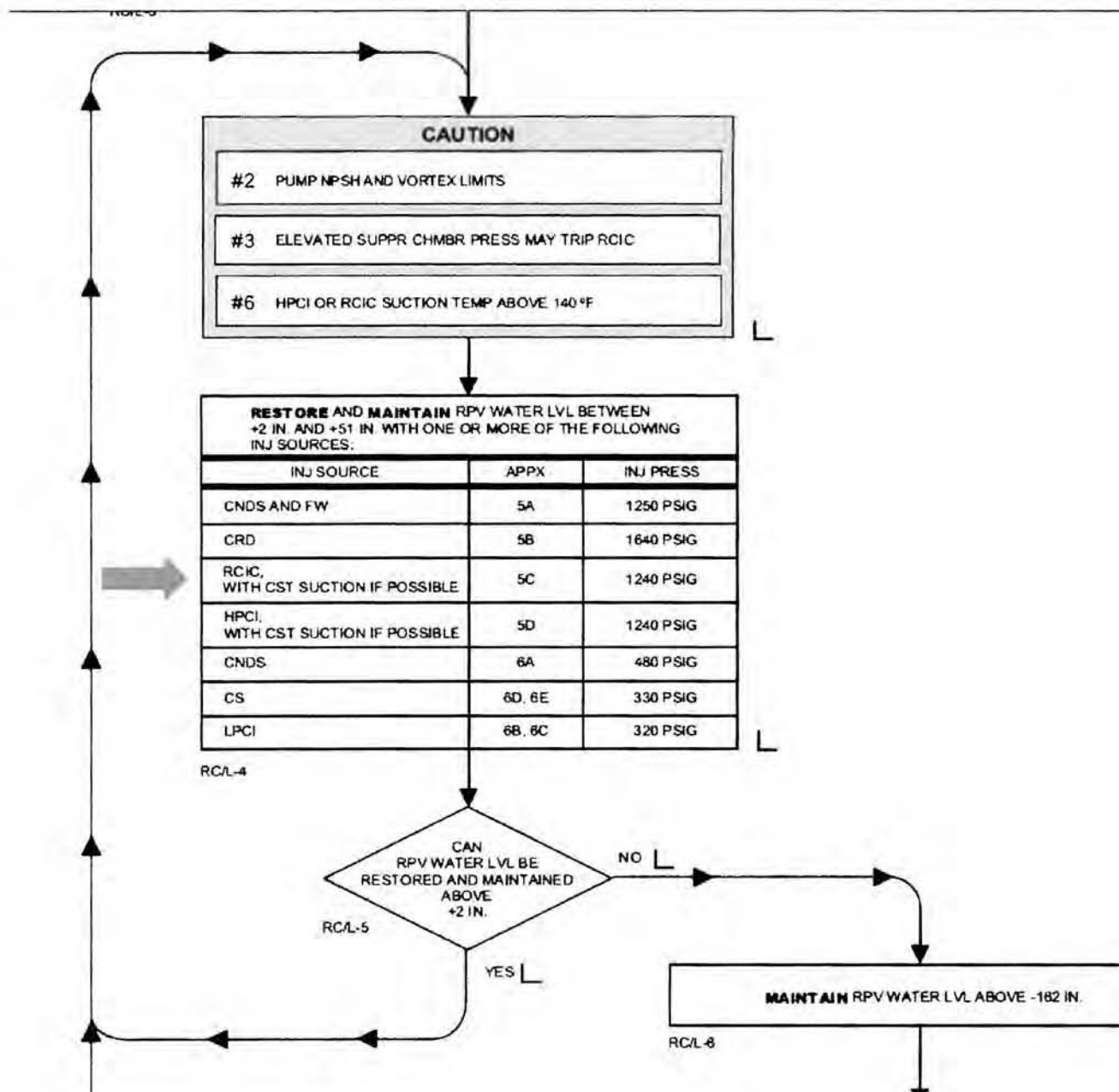
OPL171.040  
Revision 22

RCIC has no automatic transfer from CST to torus. OI-71 directs transfer of RCIC when HPCI auto transfers on low CST level or high torus level and if RCIC trips on low suction pressure 10" Hg vacuum.

BFN Unit 2	Reactor Core Isolation Cooling	2-OI-71 Rev. 0057 Page 22 of 75
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## 6.1 Normal Operation (continued)

- [5] **BEFORE** Suppression Pool temperature reaches 95°F,  
**PLACE RHR** in Suppression Pool Cooling Mode.  
(REFER TO 2-OI-74.) ☐
- [5.1] **IF** Suppression Pool temperature reaches 95°F, **THEN**  
**ENTER** 2-EOI-2 Flowchart. ☐
- [5.2] **IF** Suppression Pool temperature reaches 105°F, **THEN**  
**SHUT DOWN** RCIC System operation and return to  
Standby Readiness.  
**REFER TO** Step 6.1[12] or 6.1[13]. ☐
- [6] **MAINTAIN** Suppression Pool level between -5.5 and -2 in.  
(REFER TO 2-OI-74.) ☐
- [7] **MONITOR** CST 2 LEVEL, 2-LI-2-161A, on Panel 2-9-6. ☐
- [8] **IF ANY** of the following conditions occur while RCIC is  
injecting into the RPV:
- Suppression Pool level reaches +7 in., **OR** ☐
  - HPCI suction auto transfers to suppression pool, **OR** ☐
  - RCIC Turbine trips on pump low suction pressure, **THEN**
- PERFORM** the following steps to transfer RCIC Suction to the  
Suppression Pool:
- [8.1] **OPEN** RCIC SUPPR POOL INBD SUCT VALVE,  
2-FCV-71-17. ☐
- [8.2] **OPEN** RCIC SUPPR POOL OUTBD SUCT VALVE,  
2-FCV-71-18. ☐
- [8.3] **WHEN** RCIC SUPPR POOL INBD SUCT VALVE,  
2-FCV-71-17, and the RCIC SUPPR POOL OUTBD  
SUCT VALVE, 2-FCV-71-18, are fully open, **THEN**  
**VERIFY CLOSED** RCIC CST SUCTION VALVE,  
2-FCV-71-19 ☐



11. IF ..... It is desired to align RCIC suction to the  
Suppression Pool,

THEN ... PERFORM the following:

- a. OPEN 2-FCV-71-17, RCIC SUPPR POOL INBD  
SUCT VALVE. \_\_\_\_\_
- b. OPEN 2-FCV-71-18, RCIC SUPPR POOL OUTBD  
SUCT VALVE. \_\_\_\_\_
- c. WHEN ... 2-FCV-71-17, RCIC SUPPR POOL INBD  
SUCT VALVE, and 2-FCV-71-18, RCIC  
SUPPR POOL OUTBD SUCT VALVE, are  
fully open,  
THEN ... VERIFY CLOSED 2-FCV-71-19, RCIC  
CST SUCTION VALVE. \_\_\_\_\_

NOTE: Step 12.b must be performed promptly following Step  
12.a to avoid loss of suction path.

12. IF ..... It is desired to align RCIC suction to the  
Condensate Storage Tank,

THEN ... PERFORM the following:

- a. CLOSE 2-FCV-71-17, RCIC SUPPR POOL INBD  
SUCT VALVE. \_\_\_\_\_
- b. WHEN ... 2-FCV-71-17, RCIC SUPPR POOL INBD  
SUCT VALVE starts traveling closed,  
THEN ... OPEN 2-FCV-71-19, RCIC CST SUCTION  
VALVE. \_\_\_\_\_
- c. CLOSE 2-FCV-71-18, RCIC SUPPR POOL OUTBD  
SUCT VALVE. \_\_\_\_\_

LAST PAGE

## Examination Outline Cross-reference:

241000 Reactor/Turbine Pressure Regulator

**A1.01** (10CFR 55.41.5)

Ability to predict and/or monitor changes in parameters associated with operating the REACTOR/TURBINE PRESSURE REGULATING SYSTEM controls including:

- Reactor pressure

Proposed Question: **# 59**

Unit 3 is at 93% Reactor Power.

Which ONE of the following completes the statements?


For this power level, EHC Pressure Set is nominally set to   (1)   psig.IF **ONE** Turbine Control Valve were to fail OPEN, then Reactor Pressure, upon stabilizing, would be   (2)  .

- A. (1) 955  
   (2) lower

- B. (1) 1036  
   (2) lower



- D. (1) 1036  
   (2) the same

Proposed Answer: **A**Post-Exam Evaluation  
Recommendation:Accept both "A" and  responses

Level	RO	SRO
Tier #	2	—
Group #	2	—
K/A #	241000A1.01	—
Importance Rating	3.9	—



## Challenge Issue:

***The correct answer originally submitted to the NRC by the BFN Exam Team was "C" based on theoretical documented system response. Operations personnel performing exam validation indicated that there was actual plant OE which indicated pressure would lower a small amount for the conditions identified in the question. The scenario was run on Unit 3 simulator and pressure lowered a small amount (approximately .5%). If this were an analog display, versus digital, there is a high probability that it wouldn't be noticeable. But, based on validation input, the correct answer was changed to A.***

***There are several references which would lead a candidate to conclude that pressure would return to setpoint after the perturbation; including FSAR sections 7.11 and 11.2, EHC Controls Lesson Plan OPL171.228, and Unit 3 Simulator Malfunction Cause & Effects Manual.***

OPL171.228 ELECTRO-HYDRAULIC CONTROL LOGIC

Steam Pressure Control maintains either the Header Pressure or the Reactor Pressure at a pressure reference setpoint. Steam pressure control, as a reactor pressure controlling parameter is utilized at all times, either by the Bypass Valve Control or the Turbine Control. The system controls reactor pressure such that a change of 1 psig in reactor pressure causes a change of 1.1% in steam flow demanded which the system converts to valve opening demanded and sends to the Turbine Control and/or Bypass Control valves (3.3% per psig when selected to control on header pressure). As reactor power is increased, reactor pressure increases and as pressure increases the EHC system opens the Turbine Control valves or Bypass Control valves to use the extra steam produced by the increased power.

FSAR 11.2 TURBINE-GENERATOR

During normal operations, the steam admitted to the turbine is controlled by the pressure regulator which maintains essentially constant pressure at the turbine inlet, thus controlling reactor vessel pressure. The EHC system pressure regulator can control reactor pressure directly. The ability of the station to follow system load depends on adjustment of reactor power level. This is accomplished by changing Reactor Coolant Recirculation System flow or repositioning of control rods.

FSAR 7.11 PRESSURE REGULATOR AND TURBINE-GENERATOR CONTROL

The pressure regulation function of the turbine control system is designed to manipulate turbine control valves and turbine bypass valves, individually or in parallel, to maintain reactor pressure within a narrow range of the pressure setpoint as reactor power varies from 0



percent to 100 percent nuclear boiler rated flow.

***According to the Simulator Cause & Effects Manual:***

BROWNS FERRY UNIT 3 MALFUNCTION CAUSE AND EFFECTS

06/14/06 - REV 3

TC08 CONTROL VALVE POSITION UNIT FAILURE:

A) FCV 1-75

EFFECTS:

THIS MALFUNCTION WILL CAUSE THE SELECTED CONTROL VALVE TO BE POSITIONED AS DEMANDED BY THE INSTRUCTOR. THE POSITION INDICATOR FOR THE CONTROL VALVE WOULD REFLECT THE POSITION CHANGE. ALSO, THE RECORDED TOTAL CONTROL VALVE POSITION COULD RESPOND TO THE VALVE POSITION CHANGE IF THE GENERATOR BREAKER IS CLOSED AND THE OTHER CONTROL VALVES ARE NOT ABLE TO COMPENSATE. THE EHC SYSTEM PRESSURE CONTROL UNIT WILL RESPOND BY POSITIONING THE OTHER CONTROL VALVES AND/OR BYPASS VALVES IN RESPONSE TO ANY PRESSURE CHANGE.

IF THE SELECTED VALVE IS POSITIONED TO A LOWER VALUE THAN REQUIRED BY THE PRESSURE CONTROL UNIT, THE OTHER CONTROL VALVES AND/OR BYPASS VALVES WILL OPEN TO COMPENSATE AS PRESSURE INCREASES.

IF THE CONTROL VALVE IS POSITIONED TO A HIGHER VALUE THAN REQUIRED BY THE PRESSURE CONTROL UNIT, THE OTHER CONTROL VALVES AND/OR BYPASS VALVES WILL CLOSE TO COMPENSATE AS PRESSURE DECREASES.

IF SYSTEM VALVE POSITIONING IS LIMITED BY ANY OTHER MECHANISM (i.e. MAX COMBINED FLOW LIMITER, CONTROL VALVES FULLY OPEN, ETC.), THE SYSTEM RESPONSE WOULD BE ALTERED AND A REACTOR PRESSURE CHANGE AND ITS ACCOMPANYING EFFECTS ON POWER COULD RESULT.

***Based on these references the candidate would reasonably expect the EHC System to maintain essentially constant pressure at the turbine inlet, thus controlling reactor vessel pressure. Therefore, following failure of ONE Turbine Control Valve open, the candidate would conclude that the remaining valves would close to compensate for the pressure decrease***

*and Reactor Pressure would stabilize at the same pressure.  
This makes both 'A' and 'C' a correct response.*

Candidate Performance:

8 of 9 candidates selected 'C' as the correct answer. 1 candidate selected 'A' and this candidate was the SRO Upgrade.

Technical Reference(s): 2-GOI-100-1A Rev 139 (Attach if not previously provided)  
OPL171.228 Rev 3 (Including version / revision number)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: V.B.9 (As available)

Question Source:

Bank #  
Modified Bank #

(Note changes or attach parent)

New ☒

Question History:

Last NRC Exam

*(Optional - Questions validated at the facility since 10/95 will generally undergo less rigorous review by the NRC; failure to provide the information will necessitate a detailed review of every question.)*

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis ☒

10 CFR Part 55 Content: 55.41 ☒

55.43

Comments:

Examination Outline Cross-reference:  
2.2.13 - Knowledge of tagging and clearance procedures.

Level	RO	SRO
Tier #	3	—
Group #	—	—
K/A #	G2.2.13	—
Importance Rating	4.1	—

Proposed Question: **# 68**

Which ONE of the following completes the following statements regarding the thawing process for a freeze plug in accordance with SPP-10.2, Appendix E, "Special Requirements For Mechanical Clearances?"

During the time that the freeze plug is being thawed, the clearance is required to be   (1)   **AND** the vents/drains are required to be verified   (2)  .

- A. (1) Released but tags still on boundary valves  
(2) OPEN
- B. (1) Released but tags still on boundary valves  
(2) CLOSED
- C. (1) Actively Issued (held) all tags in place  
(2) OPEN
- D. (1) Actively Issued (held) all tags in place  
(2) CLOSED

Proposed Answer: **B**

Post-Exam Evaluation  
Recommendation:

**Delete the Question**

## Challenge Issue:

***This question was drafted after we returned from the Atlanta In-office review with the NRC. The question was unintentionally written at the wrong license level (RO versus SRO) and not linked to job requirements of a Reactor Operator. The requirements for releasing a clearance associated with a freeze seal would be determined, briefed, and directed by a SRO. There are no objectives in OPL171.086, "TVAN CLEARANCE PROGRAM" Lesson Plan specific to the requirements of Freeze Seals.***

OPDP-1, "Conduct of Operations," provides the following guidance:

## 6.3C Preparation for Clearance Removal

When preparing to remove a clearance the SRO will:

- ☐ Review restoration of clearance sequencing to ensure the restoration specified is accurate for plant conditions, specific tags to remove, and precautions
- ☐ Ensure verification of components configuration inside the clearance boundary based on work performed and controls imposed by work documents before the tags are removed
- ☐ Ensures the operator removing the clearance reviews the lift and then ensures a pre-job brief is conducted

***This question evaluates knowledge and abilities at a level that is unique to the SRO job position. Therefore, in accordance with NUREG 1021 ES-401, this is an SRO-Only question.***

***Additional information provided during Exam Analysis with the candidates (from the SRO Upgrade) was that in fact, due to conservative decision-making practices, in his only experience in dealing with a freeze seal to replace a CRD Valve, the clearance was revised to keep the tags that were still hanging active, versus the Clearance being released with the tags still hanging; as the shift felt like there would no longer be any "administrative controls" over the tags that were still hanging.***

## Candidate Performance:

All RO candidates selected an incorrect answer. 4 selected 'D' and 2 selected 'C'. All SRO candidates selected the correct answer.

Technical Reference(s): SPP-10.2 Rev 12 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: (As available)

Question Source:

Bank #  
Modified Bank #

New X

(Note changes or attach parent)

Question History:

Last NRC Exam

(Optional - Questions validated at the facility since 10/95 will generally undergo less rigorous review by the NRC; failure to provide the information will necessitate a detailed review of every question.)

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X  
55.43

Comments:

## F. The following instructions govern the use of freeze plugs

1. The clearance should be in place, but not issued, before establishing the freeze plug.
2. The need for the freeze plug should be identified on the Remarks Section of the clearance sheet. The freeze plug should not be listed as a device held on the clearance sheet. The establishment and maintenance of the freeze plug shall be in accordance with approved procedures or work documents.
3. The freeze plug must be attended by qualified personnel to ensure that it is maintained intact until all work is complete and the proper Post Maintenance Tests (PMTs) are performed.
4. If the clearance must be released to allow performance of a PMT, the equipment must be retagged before allowing the freeze plug to thaw. This will prevent migration of a portion of the plug.
5. The clearance must be released before allowing the freeze plug to thaw. However, to prevent migration of the freeze plug, tags on boundary valves shall not be removed until the freeze plug has completely thawed.
6. All vents and drains must be verified CLOSED before allowing the freeze plug to thaw.