



# ENERGY NORTHWEST

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~~Confidential – Withhold under 10 CFR 2.390. Enclosure contains confidential information.~~ Confidential information removed. Koe

GO2-15-078

MAY 13 2015

Kelly Clayton  
U. S. Nuclear Regulatory Commission  
Region IV  
1600 East Lamar Boulevard  
Arlington, TX 76011-4511

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397  
INITIAL LICENSE EXAMINATION DOCUMENTATION**

Dear Mr. Clayton:

Attached is the written examination performance analysis documentation as delineated in ES-501, C.1 for the SRO and RO examinations that were given at Columbia Generating Station on April 24, 2015.

Specifically, the following materials are enclosed as attachments:

- 1) ~~Final graded Written examination answer sheets for all applicants.~~ Redacted
- 2) ~~Two clean copies of each applicant's answer sheets.~~ Redacted
- 3) Master examination and answer keys annotated to indicate any changes made while administering and grading the examination.
- 4) The questions asked by applicants while taking the written exam. Names Redacted
- 5) ~~Written exam seating chart.~~ Redacted
- 6) Completed ES-403-1, Written Examination Grading Quality Checklist
- 7) Written exam performance analysis for questions missed by half or more of the applicants.
- 8) Documentation to support a change to the SRO-only written examination answer key for question SRO-93.

The Examination Security Agreement, ES-201-3, will be sent to you as soon as all post examination signatures are complete.

**INITIAL LICENSE EXAMINATION DOCUMENTATION**

Page 2 of 2

No new regulatory commitments are made in this letter.

If you require additional information, please contact RJ Meyers, Manager, Operations Training, at (509) 377-8678.

Executed on the 12 day of MAY, 2015

Respectfully,



W. G. Hettel  
Vice President, Operations

Attachment: Exam Deficiency Analysis

cc: w/o attachments  
NRC Region IV Administrator  
NRC Senior Resident Inspector/988C  
NRC NRR Project Manager

*COLUMBIA 4/24/15*  
 Questions asked during NRC Exam

Time		
0759	RO-18	
	Q	What is the initial position of CB-7/1?
	A	Unless otherwise stated the plant conditions are normal.
0815	RO-36	
	Q	By procedure this tank (pointing at EDR-TK-2 in distractor A) is preferred but this amount would overflow it. Am I still answering the question for preferred?
	A	Question was re-read to candidate.
0820	SRO-84	
	Q	"If these conditions remain the same" What is meant by conditions?
	A	Question was re-read to candidate.
0858	RO-57	
	Q	Is alarm locked in due to a electrical fault?
	A	Question was re-read to candidate.
0905	SRO-90	
	Q	Wanted clarification of which alternate power supply.
	A	I cannot answer this question for you.

0915	RO-57	
	Q	It seems that choices B&C are both correct in that (he read both distractors).
	A	Read question and distractors back to him.
0955	SRO-84	
	Q	Am I missing a reference for this question?
	A	You have all the references we are allowed to give to you.
1003	SRO-84	
	Q	Am I missing a reference page?
	A	You have all the references we are allowed to give to you.
1007	SRO-86	
	Q	Is this 1 ADS valve or 1 required ADS valve inoperable?
	A	Question was re-read to candidate.
1020	SRO-84	
	Q	Asked if there was another page supposed to be in the handout?
	A	Told he had the correct pages in handout.
1030	RO-59	
	Q	Does pressure stop or continue at 6.0 in Hg?
	A	At this point in time.

1045	RP-18	
	Q	What is the condition of the breaker?
	A	Conditions are normal unless otherwise stated in the question.
1100	SRO-83	
	Q#1	Are IRM's fully inserted, or in process of being inserted?
	A#1	IRM & SRM fully inserted.
	Q#2	With 2 SRV's open the pressure stated does not make sense for the automatic opening of SRV's.
	A#2	I cannot answer this question for you at this time.
1105	SRO-90	
	Q	Did you lose both the AC and DC?
	A	I cannot answer this question for you.
1115	SRO-84	
	Q	Are there references I am missing?
	A	You have all reverences available.
1120	RO-41	
	Q	"Scram valves" is it in reference to "Scram Outlet Valves", or "Scram Solenoid Valves"?
	A	Read Question to student.

1148	SRO-78	
	Q	Does the act of valving in a bottle in the DG corridor count as replacing a bottle?
	A	Did not answer question.
1230	RO-46	
	Q	Does "Utilized" mean used by operators?
	A	Referred student to dictionary to look up meaning of word utilized.
1245	RO-52	
	Q	I don't think there is a correct answer because primary containment is not a choice.
	A	I cannot answer this question for you.
1245	RP-38	
	Q	What is the EPN noun name for WOA-RIS-31A/31B/32A/32B
	A	Read names from the stem of question/
1258	SRO-83	
	Q	Has the CRS entered any EOP's or ABN's?
	A	All applicable EOP's are entered.
1313	SRO-78	
	Q	Does valving in the bottle in the DG corridor count as replacing a bottle?

	A	Read Question to applicant.
1332	RO-62	
	Q	All of these are IA's. This question does not make any sense.
	A	Read entire question pausing after each condition stated in stem.

Examination Outline Cross-Reference	Level	SRO
<b>234000 Fuel Handling Equipment</b>  <b>K5. Knowledge of the operational implications of the following concepts as they apply to FUEL HANDLING EQUIPMENT</b>  <b>K5.02 †Fuel handling equipment interlocks</b>	<b>Tier</b>	2
	<b>Group</b>	2
	<b>K/A #</b>	234000.K5.02
	<b>Rating</b>	3.7
	<b>Rev / Date</b>	2

Proposed Question: SRO – 18 (93)

Answer the following questions regarding refueling bridge hoist interlocks:

- 1) The \_\_\_\_\_ Interlock is required to be operable by Technical Specifications during in-vessel fuel movement.
  - 2) According to the Technical Specification Bases document, this interlock is intended to \_\_\_\_\_.
- A. 1) Fuel Hoist  
2) ensure grapple is fully closed to prevent fuel damage when lifting a fuel bundle
  - B. 1) Main Hoist Fuel Loaded  
2) ensure grapple is fully closed to prevent fuel damage when lifting a fuel bundle
  - C. 1) Fuel Hoist  
2) prevent a prompt reactivity excursion during refueling could potentially result in fuel failure
  - D. 1) Main Hoist Fuel Loaded  
2) prevent a prompt reactivity excursion during refueling could potentially result in fuel failure

Proposed Answer: C

Explanation (Optional):

- A (incorrect)      1) First part is correct – the Fuel Hoist Interlock is required to be operable by technical specifications
- 2) Second part is incorrect as the Fuel Hoist interlock is not related to the grapple function. Plausible if applicant confused Fuel Hoist Interlock with Main Hoist Fuel Loaded Interlock which is designed to prevent lifting a partially grappled fuel assembly which could result in fuel damage if the partially grappled fuel assembly is subsequently dropped.



- B (incorrect)      1) First part is incorrect – the Main Hoist Fuel Loaded Interlock is not required by technical specifications.
- 2) Second part is incorrect but plausible since the main hoist fuel loaded interlock is designed to prevent lifting a partially grappled fuel assembly which could result in fuel damage if the partially grappled fuel assembly is subsequently dropped.
- C (CORRECT)      1) First part is correct –The Fuel Hoist Interlock is required by technical specifications on the basis that it prevents in-vessel fuel loading with any control rod not fully inserted.
- 2) This interlock is intended to prevent a prompt reactivity excursion during fuel loading. SRO-only requirement met due to fuel handling and tech spec bases aspects to the question.
- D (incorrect)      1) First part is incorrect (see distractor B)
- 2) Second part is correct for the Fuel Hoist Interlock.

Technical Reference(s):      TS 3.9.1, TS 3.9.1 Bases  
(Attach if not previously provided,  
including version/revision number) \_\_\_\_\_

Proposed references to be provided to applicants during examination: NONE

Learning Objective:      53.62 (As available)

Question Source:      Bank # \_\_\_\_\_  
                         Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
                         New      X

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      F / 3  
                         Comprehension or Analysis      \_\_\_\_\_

10 CFR Part 55 Content:      55.41 \_\_\_\_\_  
                         55.43 2

Comments:

Examination Outline Cross-Reference	Level	SRO
<b>234000 Fuel Handling Equipment</b>  <b>K5. Knowledge of the operational implications of the following concepts as they apply to FUEL HANDLING EQUIPMENT</b>  <b>K5.02 †Fuel handling equipment interlocks</b>	<b>Tier</b>	2
	<b>Group</b>	2
	<b>K/A #</b>	234000.K5.02
	<b>Rating</b>	3.7
	<b>Rev / Date</b>	2

Proposed Question: SRO – 18 (93)

Answer the following questions regarding refueling bridge hoist interlocks:

- 1) The \_\_\_\_\_ Interlock is required to be operable by Technical Specifications during in-vessel fuel movement.
  - 2) According to the Technical Specification Bases document, this interlock is intended to \_\_\_\_\_.
- A. 1) Fuel Hoist  
2) ensure grapple is fully closed to prevent fuel damage when lifting a fuel bundle
  - B. 1) Main Hoist Fuel Loaded  
2) ensure grapple is fully closed to prevent fuel damage when lifting a fuel bundle
  - C. 1) Fuel Hoist  
2) prevent a prompt reactivity excursion during refueling could potentially result in fuel failure
  - D. 1) Main Hoist Fuel Loaded  
2) prevent a prompt reactivity excursion during refueling could potentially result in fuel failure

Proposed Answer: C, D

Explanation (Optional):

- A (incorrect) 1) First part is correct – the Fuel Hoist Interlock is required to be operable by technical specifications.
- 2) Second part is incorrect as the Fuel Hoist interlock is not related to the grapple function. Plausible if applicant confused Fuel Hoist Interlock with Main Hoist Fuel Loaded (Hoist Loaded) Interlock which is designed to prevent lifting a partially grappled fuel assembly which could result in fuel damage if the partially grappled fuel assembly is subsequently dropped.

B (incorrect) 1) First part is incorrect – the Main Hoist Fuel Loaded (Hoist Loaded) Interlock is not required by technical specifications.

2) Second part is incorrect but plausible since the Main Hoist Fuel Loaded (Hoist Loaded) interlock is designed to prevent lifting a partially grappled fuel assembly which could result in fuel damage if the partially grappled fuel assembly is subsequently dropped.

C (CORRECT) 1) First part is correct –The Fuel Hoist Interlock (which is given the term “Refueling platform fuel grapple fuel loaded” interlock) is required by technical specifications on the basis that it prevents in-vessel fuel loading with any control rod not fully inserted. This term is used in System Description SD000207 page 27 of 51. Additionally, the term “Main hoist” is also used to describe the same interlock. The term Fuel Hoist is not used in Technical Specification SR 3.9.1.1 (page 3.9.1.2) or Technical Specification Bases (page B 3.9.1-1) to describe this interlock.

2) This interlock is intended to prevent a prompt reactivity excursion during fuel loading. SRO-only requirement met due to fuel handling and tech spec bases aspects to the question.

D (CORRECT) 1) First part is correct – The term “Main Hoist Fuel Loaded” more closely describes the terms used in SR 3.9.1.1 “fuel loaded” and the technical specification bases B 3.9.1 “fuel grapple (main hoist)”. Therefore this term should be accepted to describe the technical specification required surveillance in SR 3.9.1.1 c. The term “Main hoist fuel loaded” will be modified to “Hoist Loaded” in SD000207 page 27 of 51 to remove any future confusion and provide alignment with the term used in the LCS surveillance OSP-NSSE-C401 which is used to test the SD000207 described interlock as required per LCS SR 1.9.1.6.

2) Second part is correct (see answer C above).

Technical Reference(s): TS 3.9.1, TS 3.9.1 Bases, OSP-NSSE-C401, Rev 8, page 9-  
(Attach if not previously provided, 10, SD000207, Fuel Handling, Rev 12, page 27.  
including version/revision number)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 5362 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

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 F / 3

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 2

Comments: Submitted for consideration of two correct answers: C or D. Justification is provided above.

### 3.9 REFUELING OPERATIONS

#### 3.9.1 Refueling Equipment Interlocks

LCO 3.9.1 The refueling equipment interlocks associated with the refuel position shall be OPERABLE.

APPLICABILITY: During in-vessel fuel movement with equipment associated with the interlocks when the reactor mode switch is in the refuel position.

#### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required refueling equipment interlocks inoperable.	A.1 Suspend in-vessel fuel movement with equipment associated with the inoperable interlock(s).	Immediately

#### SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.9.1.1 Perform CHANNEL FUNCTIONAL TEST on each of the following required refueling equipment interlock inputs:</p> <ul style="list-style-type: none"> <li>a. All-rods-in,</li> <li>b. Refueling platform position,</li> <li>c. Refueling platform fuel grapple fuel-loaded,</li> <li>d. Refueling platform frame-mounted hoist fuel-loaded, and</li> <li>e. Refueling platform trolley-mounted hoist fuel-loaded.</li> </ul>	7 days

## B 3.9 REFUELING OPERATIONS

### B 3.9.1 Refueling Equipment Interlocks

#### BASES

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#### BACKGROUND

Refueling equipment interlocks restrict the operation of the refueling equipment or the withdrawal of control rods to reinforce unit procedures in preventing the reactor from achieving criticality during refueling. The refueling interlock circuitry senses the conditions of the refueling equipment and the control rods. Depending on the sensed conditions, interlocks are actuated to prevent the operation of the refueling equipment or the withdrawal of control rods.

GDC 26 of 10 CFR 50, Appendix A, requires that one of the two required independent reactivity control systems be capable of holding the reactor core subcritical under cold conditions (Ref. 1). The control rods, when fully inserted, serve as the system capable of maintaining the reactor subcritical in cold conditions during all fuel movement activities and accidents.

Two channels of instrumentation are provided to sense the position of the refueling platform, the loading of the refueling platform fuel grapple (main hoist), and the full insertion of all control rods. Additionally, inputs are provided for the loading of the refueling platform frame-mounted (auxiliary) hoist and the loading of the refueling platform trolley-mounted (monorail) hoist. With the reactor mode switch in the shutdown or refuel position, the indicated conditions are combined in logic circuits to determine if all restrictions on refueling equipment operations and control rod insertion are satisfied.

A control rod not at its full-in position interrupts power to the refueling equipment to prevent operating the equipment over the reactor core when loaded with a fuel assembly. Conversely, the refueling equipment located over the core and loaded with fuel inserts a control rod withdrawal block in the Reactor Manual Control System to prevent withdrawing a control rod.

The refueling platform has two mechanical switches that open before the platform or any of its hoists are physically located over the reactor vessel. Each hoist load is sensed by an electronic load cell. The fuel grapple and frame-mounted hoist load signals are inputs to a programmable logic controller (PLC). The PLC performs the associated interlock and load functions. The trolley-mounted hoist load cell inputs to setpoint modules that perform their associated interlock and load functions. The PLC and setpoint modules open the associated fuel-loaded circuits at a load lighter

(2) BACKUP HOIST LIMIT

This interlock is a backup to the normal grapple upper limit switch. The hoist is stopped by the backup limit 6" higher than the normal limit on grapple normal up switch failure.

(3) GRAPPLE FULL DOWN

This interlock stops the main hoist's downward travel 554" (46' 2") on the hoist readout.

(4) SLACK CABLE

This interlock prevents lowering of the main hoist when there is < 50# on the load cell indicating that the grapple is resting on something. It is activated by a hydraulic line pressure switch, which is set to release when the fuel grapple hoist load is less than 50 pounds.

→ (5) FUEL HOIST INTERLOCK

This interlock disables the fuel hoist whenever the platform is over the reactor vessel, a control rod is withdrawn and there is a fuel load on the main (FUEL) hoist. When the light is on the fuel hoist will be inoperative. (750# w/NF 500 mast). The load cell force switch, which provides this interlock, also feeds the Main Hoist Fuel Loaded interlock.

→ (6) MAIN HOIST FUEL LOADED

This interlock ensures that the grapple is fully closed when lifting a fuel bundle. If the grapple is not fully closed and there is a load on the main hoist, the hoist raise logic stops upward movement. (750# w/NF 500 mast)

(7) HOIST JAM

This interlock stops upward movement of the main hoist if load exceeds 1700 pounds with NF 500 mast, which indicates excessive load.

(8) GRAPPLE RELEASED

The interlock will prevent upward motion of the hoist if the Grapple Closed limit switch is not satisfied and a load is sensed on the main hoist.

(9) ZONE BOUNDARY LOCKOUT

Raising and lowering of the main fuel hoist is prohibited when the bridge, trolley and grapple are not within the programmed boundary. This lockout is overridden with the zone boundary bypass (ZBB) keyswitch in the BYPASS position. Mast Slow zones are not affected by this keyswitch.

*Main Hoist Fuel Loaded  
is the same as →*

*Hoist Loaded is the  
proper name to  
describe this  
inter lock!*



## Learning Objectives

- ▣ 5357 - State the purpose of each of the refueling bridge hoist:
  - Main Hoist (fuel grapple)
  - Trolley Aux. Hoist
  - Monorail Aux. Hoist
  
- ▣ 5362 - Given a copy of Technical Specification, locate and apply the Safety Limits and LCO's directly associated with Fuel Handling



# Learning Objectives

- ▣ 5358 - Explain the following Refueling Bridge indication:
  - GRAPPLE NORMAL UP
  - SLACK CABLE
  - ENGAGE/RELEASE
  - HOIST LOADED
  - GRAPPLE ENGAGED
  - BRIDGE REVERSE STOP # 1
  - BRIDGE REVERSE STOP #2

[illegible]

Number: OSP-NSSE-C401	Use Category: CONTINUOUS	Major Rev: 008
Title: Refuel Platform Crane & Hoist Interlock Surveillance		Minor Rev: N/A
		Page: 2 of 18

DESCRIPTION OF CHANGES

<b>Justification (required for major revision)</b>
See below

Page(s)	Description (Including summary, reason, initiating document, if applicable)
13,14	Modified sections 7.6 and 7.7 to clarify steps and identify acceptable range for overload cutoff (AR-285022)

Number: OSP-NSSE-C401	Use Category: CONTINUOUS	Major Rev: 008
Title: Refuel Platform Crane & Hoist Interlock Surveillance		Minor Rev: N/A
		Page: 3 of 18

## 1.0 PURPOSE

- 1.1 This surveillance provides instructions for verifying operability of each refueling platform crane or hoist used for handling of control rods or fuel assemblies within the reactor pressure vessel per Licensee Controlled Specification SR 1.9.1.1 through 1.9.1.8, and the Reactivity Management Program. {P-95446}
- 1.2 This surveillance is performed within 7 days prior to the start of refueling operations.
- 1.3 This surveillance may be performed as part of the post modification or maintenance test following maintenance activities on the bridge.

## 2.0 REFERENCES

- 2.1 NRC Inspection Report 87-009-02-00, Item 87-009-02-02 {C-9783}
- 2.2 LER 93-011-00, Refuel Surveillance Test Weights {C-8767}
- 2.3 SWP-RXE-01, Reactivity Management Program {P-95446}
- 2.4 Licensee Controlled Specification SR 1.9.1.1 - SR 1.9.1.8 {R-12418}
- 2.5 TER 94-0303
- 2.6 PPM 1.3.18, Foreign Material Control Around the Spent Fuel Pool, The Reactor Cavity and the Dryer-Separator Plt.
- 2.7 PPM 10.25.6, Refueling Platform Maintenance and Testing - Electrical
- 2.8 PPM 10.27.47, Refuel Bridge Main, Monorail and Auxiliary Hoist Load Cell Calibration
- 2.9 SOP-REFUEL-OPS, Refuel Bridge Operation
- 2.10 PPM 10.3.10, Refueling Platform Planned Maintenance-Mechanical

## 3.0 PREREQUISITES

- 3.1 **VERIFY** Communications have been established between the Control Room and the Refuel Floor. \_\_\_\_\_
- 3.2 **VERIFY** the associated load cells have been calibrated within the past 12 months. \_\_\_\_\_
- 3.3 **VERIFY** the refuel bridge area radiation monitor installed and in service prior to refueling bridge use for handling radioactive components. {C-9783} \_\_\_\_\_

Number: OSP-NSSE-C401	Use Category: CONTINUOUS	Major Rev: 008
Title: Refuel Platform Crane & Hoist Interlock Surveillance		Minor Rev: N/A
		Page: 9 of 18

### 7.3 NF500 Mast Hoist Loaded and Overload Cutoff Interlocks

**NOTE:** The following steps verify the Main Hoist Loaded and Main Hoist Jam interlocks actuate at the proper setpoint for the NF500 mast.

**NOTE:** The NF500 Test Weight is a two stage weight that as it is lifted the first stage lifts approximately 10 inches prior to the weight of the second stage being transferred to the mast.

**NOTE:** When raising and lowering the main hoist for this surveillance, it may be necessary to operate the hoist manually using the optional handwheel to provide sufficient precision in controlling hoist load.  
See SOP-REFUEL-OPS for manual operation of the Main Hoist.

- 7.3.1 **ATTACH** the Main Hoist grapple to the NF500 Test Weight. \_\_\_\_\_
- 7.3.2 **SLOWLY RAISE** and **LOAD** the main hoist until the HOIST LOADED lamp on the trolley control panel energizes. \_\_\_\_\_
- 7.3.3 **RECORD** the main hoist load cell reading at which the **HOIST LOADED** lamp energized.  
Lamp Energized at \_\_\_\_\_ lb. \_\_\_\_\_
- \$ 7.3.4 **VERIFY** hoist loaded lamp energizes prior to GE 696 lbs. indicated (SR 1.9.1.6). \_\_\_\_\_
- 7.3.5 **LOWER** the mast until the hoist loaded lamp extinguishes. \_\_\_\_\_
- 7.3.6 **PERFORM** the following on top of trolley
  - a. **OPEN** the Control Center Cabinet door \_\_\_\_\_
  - b. **LOCATE** indicator lights A1 and A2 in Rack 1 Slot 7 of the PLC Rack. \_\_\_\_\_
  - c. **MANUALLY ACTUATE** the cabinet door limit switch to restore hoist control power with cabinet door open and by pulling switch actuator out away from the door. \_\_\_\_\_
- \$ 7.3.7 **SLOWLY RAISE** the mast to load the main hoist until A1 and A2 indicating lamps deenergize, simultaneously with Hoist Loaded lamp energized (SR 1.9.1.7). \_\_\_\_\_
- 7.3.8 **CLOSE** the Control Center cabinet door. \_\_\_\_\_

Number: OSP-NSSE-C401	Use Category: CONTINUOUS	Major Rev: 008
Title: Refuel Platform Crane & Hoist Interlock Surveillance		Minor Rev: N/A
		Page: 10 of 18

**NOTE:** The following steps verify the operability of the Main Hoist overload interlock.

- 7.3.9 **SLOWLY RAISE** the mast to load the main hoist with both stages of the test weight, until the HOIST JAM red indicating lamp on the left hand controller energizes. \_\_\_\_\_
- \$ 7.3.10 **VERIFY** hoist jam occurs at LT 1649 lbs. indicated. \_\_\_\_\_
- \$ 7.3.11 **VERIFY** that further hoist raise motion using electrical controls is prohibited (SR 1.9.1.1). \_\_\_\_\_
- 7.3.12 **SLOWLY LOWER** the NF500 Test Weight to the floor. \_\_\_\_\_
- 7.3.13 **VERIFY** the SLACK CABLE red light illuminated \_\_\_\_\_

**NOTE:** Opening the Main Disconnect affects the mast position indication.

- 7.3.14 **OPEN** the MAIN DISCONNECT (located on the south end of the bridge walkway) \_\_\_\_\_
- 7.3.15 **VERIFY** the grapple remains engaged by visually observing the grapple at the end of the mast (binoculars may be used, if needed). \_\_\_\_\_
- 7.3.16 **CLOSE** the MAIN DISCONNECT \_\_\_\_\_
- 7.3.17 **RELEASE** the main hoist grapple. \_\_\_\_\_
- 7.3.18 **RAISE** the mast to the FULL UP position. \_\_\_\_\_
- 7.3.19 **RESET** the mast position indication. \_\_\_\_\_

[illegible]

Number: OSP-NSSE-W401	Use Category: CONTINUOUS	Major Rev: 006
Title: REFUEL EQUIPMENT INTERLOCKS CFT		Minor Rev: N/A
		Page: 2 of 13

DESCRIPTION OF CHANGES

<b>Justification (required for major revision)</b>
Procedure enhancements

Page(s)	Description (Including summary, reason, Initiating document, if applicable)
8, 10	Added steps to verify the Cattle Shute Gate is Open, (AR-285697)



Number: OSP-NSSE-W401	Use Category: CONTINUOUS	Major Rev: 006 Minor Rev: N/A Page: 3 of 13
Title: REFUEL EQUIPMENT INTERLOCKS CFT		

## 1.0 PURPOSE

- 1.1 Provide instructions for operating personnel to perform Channel Functional Tests for REFUEL position interlock(s) per Technical Specification SR 3.9.1.1 for Mode 5.
- 1.2 This surveillance is performed weekly during in-vessel fuel movement with equipment associated with the interlocks, when the reactor Mode Switch is in the REFUEL position.

## 2.0 REFERENCES

- 2.1 NRC Inspection Report 87-009-02-00, Item 87-009-02-02 {C-9783}
- 2.2 SOP-RWM-OPS, Rod Worth Minimizer Operations
- 2.3 OSP-NSSE-C401, Refuel Platform Crane and Hoist Interlock Surveillance
- 2.4 Technical Specification SR 3.9.1.1
- 2.5 FSAR Table 7.7-3

## 3.0 PREREQUISITES

- 3.1 **VERIFY** all control rods fully inserted,  
OR the cell's four fuel assemblies removed surrounding each removed control rod or control drive mechanism. \_\_\_\_\_
- 3.2 **VERIFY** communications have been established between the Control Room and the Refuel Floor. \_\_\_\_\_
- 3.3 **VERIFY** the refuel bridge area radiation monitor is installed and operating prior to refueling bridge use when handling irradiated components. {C-9783} \_\_\_\_\_

<p><b>NOTE:</b> The following step is to prevent rod lean by withdrawing a control rod in a cell with no fuel and no blade guides.</p>
--

- 3.4 WHEN there are cells defueled,  
THEN DESIGNATE the control Rods to be withdrawn one notch for this surveillance. \_\_\_\_\_
- 3.5 **VERIFY** OSP-NSSE-W402 (Refuel Position One-Rod-Out Interlock) current prior to withdrawing a control rod in Section 7.1. \_\_\_\_\_

CRS

Number: OSP-NSSE-W401	Use Category: CONTINUOUS	Major Rev: 006
Title: REFUEL EQUIPMENT INTERLOCKS CFT		Minor Rev: N/A
		Page: 4 of 13

#### 4.0 PRECAUTIONS AND LIMITATIONS

- 4.1 When lifting test weights, no weight should be lifted or carried over irradiated fuel in the spent fuel pool or reactor vessel.
- 4.2 Equipment that will not be used for core alterations need not be tested. Equipment not tested should be Caution tagged out of service to ensure that the required surveillance tests are completed prior to equipment use over the core.
- 4.3 Whenever practical the dummy fuel bundle should be used during the performance of this test.
- 4.4 At least two SRM's are required to be operable, one in the quadrant where core alterations are being made and one in an adjacent quadrant when a control rod is to be withdrawn in a cell containing one or more fuel assemblies.
- 4.5 Startup mode Refuel interlocks should be verified prior to placing the Reactor Mode Switch in the START/HOT STANDBY position by performance of Section 7.2.
- 4.6 When in Technical Specification LCO 3.10.4 the all-rods-in indication should be defeated by placing the normal/jumper switch on an RPIS extender card to the NORMAL position. Select a rod which has the PIP probe disconnected or is not fully inserted.
- 4.7 When in PPM 3.4.4, Natural Circulation Evaluation, Control Rods in fueled cells cannot be withdrawn to perform this surveillance and the All-Rods-In indication to the bridge needs to be defeated by use of extender board Normal/Bypass switch or other means.

#### 5.0 MATERIALS, TOOLS, AND TEST EQUIPMENT

##### 5.1 Dummy Fuel Bundle

**NOTE:** Test Weights are located in the cask area of the Spent Fuel Pool and need to be submerged when used for this test. The NF500 test weight is a two-stage weight. Test weight No. 3 is 1200 lbs. nominal.

- 5.2 Test weight 3 can be utilized.

#### 6.0 ACCEPTANCE CRITERIA

This surveillance is satisfactorily completed when all steps preceded by a # have been initialed, all other steps have either been initialed or properly documented, and the CRS/Shift Manager has reviewed and signed the cover sheet.

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## 7.0 PROCEDURE

### 7.1 Preparation

7.1.1 **VERIFY** the refuel bridge area radiation monitor is installed and operating prior to using the refueling bridge. {C-9783} \_\_\_\_\_

7.1.2 **VERIFY** a caution tag is placed on the Reactor Mode Switch which indicates the following: Verify "Startup Mode Refuel Interlocks prior to placing the Reactor Mode Switch in the START/HOT STANDBY position by performance of OSP-NSSE-W401, Section 7.3". \_\_\_\_\_

**NOTE:** Sections 7.2 and 7.3 may be completed in any order. Section 7.4 is required to be completed last.

**NOTE:** The weights and tolerances specified within this procedure for load interlocks are provided for information only. The Dummy Fuel Bundle should be used when available though any weight sufficient to actuate the load interlock is acceptable for the logic functional test of this procedure. The actual setpoints of the load interlocks are checked by OSP-NSSE-C401. The bridge travel interlocks are not able to be checked with the NF500 test weight due to the two-stage arrangement of the test weight.

### 7.2 Main Hoist Interlocks

7.2.1 **VERIFY** the Reactor Mode Switch in **REFUEL** (H13-P603). \_\_\_\_\_

7.2.2 **VERIFY** the following are not loaded:

- Main Hoist \_\_\_\_\_
- Auxillary Frame Hoist \_\_\_\_\_
- Monorail Hoist \_\_\_\_\_

7.2.3 **VERIFY** the GRAPPLE LOAD ( $P_G$ ) Indicating LED's at Activity Control Numbers 1 and 2 are extinguished (H13-P616). \_\_\_\_\_

7.2.4 **VERIFY** the refueling bridge is not located over the core. \_\_\_\_\_

7.2.5 **VERIFY** the OVER CORE ( $P_C$ ) indicating LED's at Activity Control Numbers 1 and 2 are extinguished (H13-P616). \_\_\_\_\_

**NOTE:** The Dummy Fuel Bundle is the preferred load for the performance of this test.

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- 7.2.6 **LOCATE** the dummy fuel bundle. \_\_\_\_\_
- 7.2.7 **GRAPPLE** the load,  
**AND RAISE** it to the GRAPPLE NORMAL UP position, using the main hoist. \_\_\_\_\_
- 7.2.8 **VERIFY** the GRAPPLE NORMAL UP lamp illuminates. \_\_\_\_\_
- 7.2.9 **VERIFY** hoist motion stops. \_\_\_\_\_
- 7.2.10 **OBSERVE** LED display for GRAPPLE NORMAL UP position.  
Log position \_\_\_\_\_
- 7.2.11 **DEPRESS** HOIST OVERRIDE switch,  
**AND RAISE** the hoist to the BACKUP HOIST LIMIT. \_\_\_\_\_
- 7.2.12 **VERIFY** the BACKUP HOIST LIMIT lamp illuminates. \_\_\_\_\_
- 7.2.13 **VERIFY** hoist upward motion is stopped. \_\_\_\_\_
- 7.2.14 **LOWER** the load approximately one inch below the GRAPPLE NORMAL UP position recorded in Step 7.2.10. \_\_\_\_\_
- 7.2.15 **VERIFY** the GRAPPLE NORMAL UP lamp extinguishes. \_\_\_\_\_
- 7.2.16 **RAISE** the load to the Normal Up position. \_\_\_\_\_
- 7.2.17 **VERIFY** the GRAPPLE NORMAL UP lamp illuminates. \_\_\_\_\_
- 7.2.18 **VERIFY** the GRAPPLE LOAD (P<sub>G</sub>) indicator LED's at Activity Control Numbers 1 and 2 are illuminated (H13-P616). \_\_\_\_\_
- 7.2.19 **VERIFY** the HOIST LOADED indicator on the left hand controller is illuminated. \_\_\_\_\_
- # 7.2.20 **VERIFY** the RODS NOT FULL IN (F<sub>I</sub>) indicator LED's at Activity Control Numbers 1 and 2 are extinguished (H13-P616). \_\_\_\_\_
- 7.2.21 **VERIFY** the green FULL IN indicator for the rod selected is illuminated on the full core display (vertical section of H13-P603). \_\_\_\_\_
- 7.2.22 **VERIFY** OSP-NSSE-W402 is current. \_\_\_\_\_
- 7.2.23 **IF** in Technical Specification LCO 3.10.5 (3.10.6),  
**THEN PERFORM** the following:
- a. **CHOOSE** a Control rod with an RPIS extender card which has the PIP probe disconnected or is not fully inserted.

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Control Rod Number \_\_\_\_\_

- b. **SET** the RPIS Extender Card normal/jumper switch to **NORMAL** for the selected control rod extender card.

**NOTE:** For an SRM to be considered operable in the following step, one of the following conditions is required to be satisfied per TSP-SRM-W401 (SR 3.3.1.2.4).

- Minimum count rate of 0.7 cps provided signal to noise ratio GE 20:1; or
- Minimum count rate of 3 cps provided signal to noise ratio is GE 2:1

7.2.24 **IF** NOT in Technical Specification LCO 3.10.5 (3.10.6),  
**THEN PERFORM** the following:

- a. **IF** able to withdraw a control rod for testing,  
**THEN PERFORM** the following:

- # 1) **VERIFY** the SRMs in the core quadrant of activity and an adjacent quadrant are operable prior to rod withdrawal (SR 3.3.1.2.2).
- 2) **SELECT** a single control rod as designated by the CRS for surveillance purposes, located in quadrant with an operable SRM, **AND WITHDRAW** the selected control rod one notch.

- b. **IF** unable to withdraw a control rod for testing,  
**THEN PERFORM** the following

- 1) **SELECT** a control rod other than 14-07 (H13-P603).

Control Rod Number \_\_\_\_\_

- 2) **DISCONNECT** PIP cable 8815/C12A-009 from jack J14-07 in back of H13/P615.

Simultaneous Verification \_\_\_\_\_

- 3) **IF** necessary,  
**THEN BYPASS** RWM per SOP-RWM-OPS.

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- # 7.2.25 **VERIFY** the RODS NOT FULL IN (F<sub>i</sub>) indicator LED's at Activity Control Numbers 1 and 2 are illuminated (H13-P616). \_\_\_\_\_
- # 7.2.26 IF the PIP cable was not disconnected,  
THEN VERIFY that the green FULL IN indicator for the rod selected is not illuminated on the full core display (vertical section of H13-P603). \_\_\_\_\_
- # 7.2.27 IF the PIP cable was disconnected,  
THEN VERIFY that the green FULL IN indicator for rod 14-07 is not illuminated on the full core display (vertical section of H13-P603). \_\_\_\_\_
- 7.2.28 **VERIFY** rod withdrawal blocks are not in effect on H13-P603. \_\_\_\_\_
- 7.2.29 **VERIFY** the Cattle Chute gate OPEN. \_\_\_\_\_

**NOTE:** The following step will be indicated by BRIDGE STOP REVERSE NO. 1 illuminated on the Status Display Panel and Refuel Bridge motion stopping.

- 7.2.30 **MOVE** the refueling bridge from the Fuel Pool towards the reactor cavity until the RS1 floor mounted limit switch is activated. \_\_\_\_\_
- 7.2.31 **VERIFY** the following:
- #
- Refueling bridge reverse motion is prohibited. \_\_\_\_\_
  - BRIDGE REVERSE NO. 1 illuminated on the Status Display Panel. \_\_\_\_\_
  - ROD BLOCK NO. 1 illuminated on the Status Display Panel. \_\_\_\_\_
  - FUEL HOIST INTERLOCK illuminated on the Status Display Panel. \_\_\_\_\_
  - OVER CORE (P<sub>c</sub>) indicator LED on Activity Control Number 1 only is illuminated (H13-P616). \_\_\_\_\_
  - WITHDRAW BLOCK illuminated (H13-P603) \_\_\_\_\_
- 7.2.32 **ATTEMPT** to lower the load. \_\_\_\_\_
- # 7.2.33 **VERIFY** that hoist motion is prohibited. \_\_\_\_\_
- 7.2.34 IF in Technical Specification LCO 3.10.5 (3.10.6),  
THEN PERFORM the following:
- a. **PLACE** the RPIS Extender Card normal/jumper switch to **JUMPER**.  
Control Rod Number \_\_\_\_\_
- b. **VERIFY** the RODS NOT FULL IN (F<sub>i</sub>) indicator LED's for Activity Control Numbers 1 and 2 extinguish (H13-P616). \_\_\_\_\_

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**NOTE:** If the WITHDRAW BLOCK on H13-P603 is not illuminated, rod motion may occur.

- 7.2.35 **ATTEMPT** to withdraw the selected control rod one notch. \_\_\_\_\_
- # 7.2.36 **VERIFY** no rod motion occurs. \_\_\_\_\_
- 7.2.37 **MOVE** the refueling bridge in the forward direction. \_\_\_\_\_
- 7.2.38 **VERIFY** the following indications on the Status Display Panel extinguish:
- BRIDGE REVERSE NO. 1 \_\_\_\_\_
  - ROD BLOCK NO. 1 \_\_\_\_\_
  - FUEL HOIST INTERLOCK \_\_\_\_\_
- 7.2.39 IF not in Technical Specification LCO 3.10.4,  
AND the rod was withdrawn,  
THEN PERFORM the following:
- a. **INSERT** the selected control rod. \_\_\_\_\_
  - b. **VERIFY** the RODS NOT FULL IN (F) indicator LED's for Activity Control Numbers 1 and 2 extinguish (H13-P616). \_\_\_\_\_
- NOTE:** Reconnecting cable will require multiple seatings and collar tightening to ensure connection.
- 7.2.40 IF PIP cable was disconnected,  
THEN PERFORM the following:
- a. **CONNECT** PIP cable 8815/C12A-009 to jack J14-07 (Back of H13/P615). \_\_\_\_\_
- Simultaneous Verification \_\_\_\_\_
- b. **VERIFY** normal indication for control rod 14-07 (H13-P603). \_\_\_\_\_
  - c. IF necessary,  
THEN RESTORE RWM from manual bypass per SOP-RWM-OPS. \_\_\_\_\_
- 7.2.41 **MOVE** the refueling bridge in the reverse direction past the RS1 floor mounted limit switch,  
THEN STOP refueling bridge reverse motion. \_\_\_\_\_

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7.2.42 **VERIFY** the following:

- ROD BLOCK Number 1 illuminated on the Status Display Panel. \_\_\_\_\_
- OVER CORE (P<sub>C</sub>) indicator LED for Activity Control Number 1 illuminates (H13-P616). \_\_\_\_\_

7.2.43 **VERIFY** the Cattle Chute gate OPEN. \_\_\_\_\_

7.2.44 **MOVE** the refueling bridge in the reverse direction past the RS2 floor mounted limit switch,  
**THEN STOP** refueling bridge reverse motion. \_\_\_\_\_

7.2.45 **VERIFY** the following:

- ROD BLOCK NO. 2 illuminated on the Status Display Panel \_\_\_\_\_
- OVER CORE (P<sub>C</sub>) indicator LED on Activity Control Number 2 illuminated (H13-P616) \_\_\_\_\_
- WITHDRAW BLOCK illuminated (H13-P603) \_\_\_\_\_

<p><b>NOTE:</b> If the WITHDRAW BLOCK on H13-P603 is not illuminated, rod motion may occur.</p>
---

7.2.46 **ATTEMPT** to withdraw a control rod designated by the CRS for surveillance purposes.

Control Rod Number \_\_\_\_\_

# 7.2.47 **VERIFY** no rod motion occurs. \_\_\_\_\_

7.2.48 **MOVE** the refueling bridge in the forward direction to the Spent Fuel Pool area. \_\_\_\_\_

7.2.49 **VERIFY** the following indications extinguish on the Status Display Panel as RS1 and RS2 are cleared:

- ROD BLOCK INTERLOCK NO. 1 \_\_\_\_\_
- ROD BLOCK INTERLOCK NO. 2 \_\_\_\_\_

7.2.50 **MOVE** the refueling bridge to an appropriated position in the Spent Fuel Pool, **AND UNLOAD** the hoist. \_\_\_\_\_



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### 7.3 Refuel Bridge - (Startup Mode) Interlocks

**NOTE:** Section 7.3 need not be performed if the mode switch is not placed in the START/HOT STANDBY position during refueling bridge operation. Mark this section N/A if it is not to be performed.

- 7.3.1 **VERIFY** none of the refueling bridge holsts are loaded. \_\_\_\_\_
- 7.3.2 **VERIFY** the GRAPPLE LOAD ( $P_G$ ) indicator LED's at Activity Control Numbers 1 and 2 are extinguished (H13-P616). \_\_\_\_\_
- 7.3.3 **VERIFY** the refueling bridge is not located over the core. \_\_\_\_\_
- 7.3.4 **VERIFY** the OVER CORE ( $P_C$ ) indicator LED's at Activity Control Numbers 1 and 2 are extinguished (H13-P616). \_\_\_\_\_

**NOTE:** During the following steps, with the Reactor Mode Switch on H13-P603 in the STARTUP/HOT STANDBY position, a second licensed operator is to independently verify that all control rods are fully inserted and remain fully inserted.

**NOTE:** The following step ensures the conditions of LCO 3.10.2 are met for placing the Mode Switch to STARTUP/HOT STANDBY with Reactor in Mode 5.

- 7.3.5 **VERIFY** the following:
- All control rods are fully inserted in core cells containing one or more fuel assemblies. \_\_\_\_\_  
Independent Verification \_\_\_\_\_
  - No Core Alterations are in progress. \_\_\_\_\_  
Independent Verification \_\_\_\_\_
- 7.3.6 **UNLOCK** and **PLACE** the Reactor Mode Switch in the **START/HOT STANDBY** position. \_\_\_\_\_

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**CAUTION**

**DO NOT** withdraw the control rod.

- 7.3.7     **SELECT** a control rod designated by the CRS for surveillance purposes.
- Control Rod Number \_\_\_\_\_
- 7.3.8     **VERIFY** no rod blocks are present. \_\_\_\_\_
- 7.3.9     **MOVE** the refueling bridge in the reverse direction until the RS1 floor mounted switch is activated. \_\_\_\_\_
- 7.3.10    **VERIFY** the OVER CORE (P<sub>C</sub>) indicator LED at Activity Control Number 1 is illuminated (H13-P616). \_\_\_\_\_
- 7.3.11    **CONTINUE** to move the refueling bridge in the reverse direction until the RS2 floor mounted switch is activated. \_\_\_\_\_
- 7.3.12    **VERIFY** the following:
- BRIDGE REVERSE STOP NO. 2 illuminated on the Status Display Panel. \_\_\_\_\_
  - #     • Further refueling bridge movement in the reverse direction is prohibited. \_\_\_\_\_
  - OVER CORE (P<sub>C</sub>) indicator LED at Activity Control Number 2 is illuminated (H13-P616). \_\_\_\_\_
  - WITHDRAW BLOCK illuminated (H13-P603). \_\_\_\_\_
  - #     • Attempt to withdraw the selected control rod and verify that no rod motion occurs. \_\_\_\_\_
- 7.3.13    **LOCK** the Reactor Mode Switch in the **REFUEL** position. \_\_\_\_\_
- 7.3.14    **VERIFY** the following extinguish:
- BRIDGE REVERSE STOP NO. 2 \_\_\_\_\_
  - WITHDRAW BLOCK \_\_\_\_\_
- 7.4     Reactor Mode Switch Position
- 7.4.1     WHEN Sections 7.2 and 7.3 are complete,  
THEN VERIFY the Reactor Mode Switch is locked in **REFUEL** (H13-P603). \_\_\_\_\_

8.0     DOCUMENTATION

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Maintain the completed surveillance in the permanent plant file in accordance with the appropriate record procedure(s).

#### 9.0 ATTACHMENTS

None

# PASSPORT Action Tracking

Requested By: K ELLIOTT

Request Date: 05/12/2015 17:54

# Action Request Report

TIPAA10

Page : 1

Printed: 05/12/2015 17:54

## Selection Criteria:

A/R Number: 00327602	A/R Type :	A/R Status:	Aff Fac :	Priority :
Due Date :	Orig Date :	-	-	Severity :
Event Date:	Event Code:	Reason :	Report To :	
Dscrvy Dt :	Reference :	Keyword:		
Subj/Desc :	Subj/Desc Text:	Fac/Unit/System:		
Orig ID :	Orig Fac/Group :	Orig Dept :	Orig Org :	
Owed to ID:	Owed to Fac/Grp:	Owed to Dept:	Owed to Dspln:	
Cmpl Notes: Y	No Assignments :	Print Code : ALL		
Attribute :	Attr Value :			

A/R No.: 00327602 A/R Type: TRN

Orig Date: 05/12/2015 Dscv Date:

Report To:

Aff Fac :

Event Date:

Status  
Due Date

: APPROVED 05/12/2015  
: 05/28/2015

Revise System Description SD000207, Fuel Handling  
Revise System Description SD000207, Fuel Handling, to change  
Main Hoist Interlock 'Main Hoist Fuel Loaded' to 'Hoist  
Loaded'. This is in alignment with the refuel bridge panel  
nomenclature and the associated surveillances that test  
these interlocks (OSP-NSSE-C401 and OSP-NSSE-W401).

Assign No.: 00327602 01

Primary Resp Grp :

Secondary Resp Grp :

Assignment To

: KELLIO K ELLIOTT

Aff Fac: 02

Dept: 52130

Status  
Due Date

: ACC/ASG 05/12/2015  
: 05/28/2015

Revise System Description SD000207, Fuel Handling  
Revise System Description SD000207, Fuel Handling, to change  
Main Hoist Interlock 'Main Hoist Fuel Loaded' to 'Hoist  
Loaded'. This is in alignment with the refuel bridge panel  
nomenclature and the associated surveillances that test  
these interlocks (OSP-NSSE-C401 and OSP-NSSE-W401).

Orig Due Date: 05/28/2015

TOTAL Number of Action Requests : 1

**Written Exam Performance Analysis**  
**Questions Missed By Half or More of the Applicants**

Q #	System/ Procedure	K/A	K/A Rating	LO	Key Ans	Grade	Comment	Reference
<b>RO Portion</b>								
18	CB-7/1 CP	262001.K5.02	2.6	5086	D	29%	Question was missed due to knowledge deficiency. Material was presented. Candidates were unable to recall specific details of the material.	SD000182 pg 29-32
20	E-IN-1	262002.A2.01	2.6	5896 5891	D	41%	Question was missed due to knowledge deficiency. Material was presented. Candidates were unable to recall specific details of the material.	SD000194 pg 8 ABN-ELEC-INV pg 3
57	FCP alarms	600000.AK2.01	2.6	7610	B	35%	Question was missed due to knowledge deficiency. Material was presented. Candidates were unable to recall specific details of the material.	SD000177 pg 31
73	Rad Det Type	2.3.15	2.9	5646	D	41%	Question was missed due to knowledge deficiency. Material was presented. Candidates were unable to recall specific details of the material.	SD000147 pg 36
<b>SRO Portion</b>								
81	RAD Release	295038. 2.4.44	4.4	10189	C	23%	Question was missed due to no references provided. Requires memorization of EAL Chart Table 4 and EAL flowchart. Testing of this KA is performed with references provided at Columbia.	PPM 13.2.2 Att 7.1 PPM 13.1.1 Att 7.4 Table 4
85	RB Flooding	295036.EA2.01	3.2	10295 9540	C	46%	Question was missed due to knowledge deficiency and the assumption that SW A was the source of the leak. Material was presented. Candidates were unable to recall specific details of the material.	ABN-FLOODING pg 11, SOP-RHR-SPC pg 6,8, SOP-RHR-SPC-QC pg
91	RRC Controller	202001.A2.05	4.0	11788	C	15%	Question was missed due to knowledge deficiency concerning the 6 hz stop when the Loop A/B controllers where in Manual. Material was presented. Candidates were unable to recall specific details of the material.	SD000184 pg 10-13 ABN-POWER pg 4-5
93	Fuel Handling	234000.K5.02	3.7	5362	C	8%	The term Fuel Hoist and Main Hoist are used interchangeably to describe the same TS required refuel interlock. Accept Ans C or D. Two students selected B which indicates a knowledge deficiency concerning the purpose of the interlock.	TS 3.9.1, Bases 3.9.1
94	Valve Lineups	2.1.29	4.0	3038	B	46%	Question was missed due to knowledge deficiency concerning the purpose of Attachment 7.2 (Deviation From Lock Valve Checklist). Material was presented. Candidates were unable to recall specific details of the material.	PPM 1.3.29 pg 4-6