

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	007G2.4.45	
	Importance Rating	4.1	4.3

Reactor Trip: Ability to prioritize and interpret the significance of each annunciator or alarm.

Proposed Question RO 1

Given the following conditions:

- The Unit 1 and Unit 2 reactors have experienced a reactor trip.

While performing EOP-01 'Standard Post Trip Actions' which ONE of the following annunciators, should be addressed FIRST?

(Evaluate each choice independently)

A. Unit 1: Annunciator A-60, 125V DC BUS 1AB UV.

B. Unit 2: Annunciator G-24, 15% BYPASS LCV 9005 / 9006 5% FLOW.

C. Unit 1: Annunciator J-19, 1A1 RCP SEAL TROUBLE COOLING WATER FLOW LOW.

D. Unit 2: Annunciator A-43, 120V AC INVTR 2B / INSTR BUS 2MB/2MB-1 TROUBLE.

Proposed Answer: A

Explanation (Optional):

A. Correct. This annunciator is used by the operators to confirm that the 1AB DC bus is energized (no other control room indications available) which is required by MVA safety function 4.2.D. The contingency is required to ensure DC power is available to the 1C AFW pp and valves.

B. Incorrect. This alarm comes in post trip. It tells the operator that SG level is < 45% NR and a turbine trip has occurred. The DFWCS will respond such that the 5% flow position (LCV-9005/9006) will auto clear when SG levels recover above 45% NR and at least 60 seconds has elapsed since the turbine trip. This is plausible because G-24 does provide guidance for manual control (if desired) but the alarm by itself does not drive a contingency action to be taken.

C. Incorrect. EOP-01 does state if CCW flow lost for greater than 10 minutes, stop the RCP's. This may be a contingency action but not the FIRST contingency action.

D. Incorrect. This alarm is an indication of inadequate voltage on a Vital Instr AC bus. The MVA safety function only addresses Vital & Non-Vital AC busses that transfer to the Start Up XFMR's on a reactor trip OR Vital DC buses that should remain energized post trip. The Vital Instr AC bus status is addressed in other optimal EOP MVA safety functions (after EOP-01 is exited).

Technical Reference(s): 1&2-EOP-01, SPTA's, ARP's A-60 & 43, G-24 & J-19 (Attach if not previously provided)

Ops Policy 521, EOP  
Implementation

Proposed references to be provided to applicants during examination: N/A

Learning Objective: 0702822 EO2&5 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 10  
55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 008 AK1.01	
	Importance Rating	3.2	3.7

Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident:  
Thermodynamics and flow characteristics of open or leaking valves

Proposed Question: RO 2

Given the following:

- 2 LED's are lit on the Acoustic Monitor display for PORV V1402.
- Pressurizer Pressure is 2000 psia.
- Pressurizer Temperature is 636°F
- Quench Tank Pressure is being maintained at 5 psig.

Which ONE of the following is:

- 1) the condition of the fluid downstream of the relief valve AND
- 2) the approximate temperature on TIA-1106, "Relief Valves"?

(references provided)

- 1) Superheated Steam  
2) 245°F
- 1) Superheated Steam  
2) 230°F
- 1) Wet Vapor  
2) 230°F
- 1) Wet Vapor  
2) 245°F

Proposed Answer: C

Explanation (Optional): This question is solved by using the Mollier Diagram contained in the Steam Tables.

- A. Incorrect. Both parts wrong: used 20 psia and went straight up to the saturation line to calculate temperature
- B. Incorrect. Used 20 psia but chose superheated steam for part 1
- C. Correct. Used 20 psia and went up the 20 psia slanted line to the saturation line to calculate temperature.
- D. Incorrect. Used 20 psia and went straight up to the saturation line to calculate temperature.

Technical Reference(s): FPL Thermodynamics, NUC-GFP-HXF-004 and Steam, NUC-GFP-003 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Steam Tables

Learning Objective: NUC-GFP-HXF-004-23, NUC-GFP-HXF-003-11 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 8,10  
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	EPE 009 EK3.28	
	Importance Rating	4.5	4.5

Knowledge of the reasons for the following responses as they apply to the small break LOCA: Manual ESFAS initiation requirements

Proposed Question: RO 3

Unit 1 is conducting a heatup IAW 1-GOP-303, 'Reactor Plant Heatup - Mode 3 <1750 to Mode 3 >1750.' RCS pressure is 1680 psia. Pressurizer level is 28%.

Ten minutes later a 200 gpm RCS leak develops. RCS pressure is 1580 psia and lowering rapidly. Pressurizer level is 20% and lowering. The mitigating procedure(s) for the RCS leak has been entered.

For the above conditions, SIAS should:

- A. NOT be manually actuated because automatic actuation has already occurred.
- B. NOT be manually actuated because conditions for manual actuation have not been reached.
- C. be manually actuated because automatic actuation did not occur but should have for the stated conditions.
- D. be manually actuated because signals that would result in automatic actuation are currently blocked.

Proposed Answer: D

A. Incorrect, auto action has NOT occurred in that Pressurizer pressure is blocked until 1750 psia during heatup.

B. Incorrect, conditions for manual actuation HAS been met because a valid low pressure condition exists with SIAS in the blocked mode.

C. Incorrect, automatic actuation should NOT have occurred due to Pressurizer pressure in the blocked mode.

D. Correct. Valid uncontrolled pressure decrease (SBLOCA) and SIAS blocked (Pressurizer pressure) requires manual actuation.

Technical Reference(s): 1-GOP-303, Rx Plant Heat Up (Attach if not previously provided)  
Mode 3, 1-AOP-01.08, RCS  
Leakage Abnormal Ops  

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1-ONP-01.01, Plant Condition 1  
Low Mode  

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Proposed references to be provided to applicants during examination: N/A

Learning Objective: 0702824-09 (As available)

Question Source: Bank #                       
Modified Bank #                       
New X

Question History: Last NRC Exam                     

Question Cognitive Level: Memory or Fundamental Knowledge                       
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 5, 10  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	011 EG2.4.11	
	Importance Rating	4.0	4.2

Large Break LOCA: Knowledge of abnormal condition procedures

Proposed Question: RO 4

Unit 1 is performing a cooldown for a refueling outage with the following initial conditions:

- RCS pressure is 1420 psia
- Pressurizer level is 35%
- $T_{ave}$  is 470°F

Pressurizer pressure and level are now dropping rapidly and currently indicate:

- RCS pressure is 620 psia
- Pressurizer level is 0%
- $T_{ave}$  is 468°F

Which ONE of the following states ALL the procedure(s) that will be implemented and / or referenced?

A. 1-EOP-03, 'LOCA'.

B. 1-AOP-01.08, 'RCS Leakage Abnormal Operations'.

C. 1-AOP-01.08, 'RCS Leakage Abnormal Operations'. AND 1-ONP-01.01, Plant Condition 1 Steam Generator Heat Removal LTOP Not in Effect.

D. 1-AOP-01.08, 'RCS Leakage Abnormal Operations'. AND 1-ONP-01.02, Plant Condition 2 Steam Generator Heat Removal LTOP in Effect.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Because SIAS is blocked, EOP-03 is NOT implemented. This would be correct if SIAS was NOT blocked.
- B. Incorrect. 1-AOP-01.08 is partially correct. In addition to the AOP, the Low Mode Off-Normal procedure for the current conditions will be referenced to verify Safety Functions are met. If Safety Functions are met the Low Mode is NOT implemented. If Safety Functions are NOT met then the AOP is exited and the Low Mode ONP is fully implemented.
- C. Correct
- D. Incorrect. LTOP is NOT in effect so second part incorrect.

Technical Reference(s): 1-AOP-01.08, RCS Leakage Abnormal Operations, 1-GOP-305, Rx Plant Cooldown-Hot Standby to Cold Shutdown (Attach if not previously provided)

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1-ONP-01.01, Plant Condition 1  
Steam Generator Heat Removal  
LTOP Not in Effect.

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Proposed references to be provided to applicants during examination: None

Learning Objective: PSL OPS 0702813-1 (As available)

Question Source: Bank #                       
Modified Bank #                       
New X

Question History: Last NRC Exam                     

Question Cognitive Level: Memory or Fundamental Knowledge                       
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10  
55.43 5

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 015 AA2.10	
	Importance Rating	3.7	3.7

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): When to secure RCPs on loss of cooling or seal injection

Proposed Question: RO 5

Unit 1 is operating at 100% power with the following:

### **TIME**

1306: R-26-56, CCW radiation monitor, has just gone into alarm.

1307: Due to rising Controlled Bleedoff temperature on 1A1 RCP, 1-AOP-01.09A1, "1A1 Reactor Coolant Pump" was entered.

Based on the given conditions, which ONE of the following describes:

- 1) The actions taken for HCV-14-11A1, Seal Cooler HX Isolation Valve?
  - 2) Subsequent actions the crew should take?
- A. 1) Place the control switch for HCV-14-11A1 in CLOSE.  
2) Ensure the reactor is tripped and the 1A1 RCP is secured if EITHER Controlled Bleedoff temperature exceeds 250°F OR CCW not restored within 10 minutes.
  - B. 1) Place the control switch for HCV-14-11A1 in CLOSE.  
2) Ensure the reactor is tripped and the 1A1 RCP is secured if Controlled Bleedoff temperature exceeds 250°F AND CCW not restored within 10 minutes.
  - C. 1) Verify HCV-14-11A1 is OPEN, if not go to OPEN RESET then AUTO.  
2) Ensure the reactor is tripped and the 1A1 RCP is secured if EITHER Controlled Bleedoff temperature exceeds 250°F OR CCW not restored within 10 minutes.
  - D. 1) Verify HCV-14-11A1 is OPEN, if not go to OPEN RESET then AUTO.  
2) Ensure the reactor is tripped and the 1A1 RCP is secured if Controlled Bleedoff temperature exceeds 250°F AND CCW not restored within 10 minutes.

Proposed Answer: A

Explanation (Optional):

- A. Correct. This is the guidance for this event (indication of CCW activity).
- B. Incorrect. Part 1 correct. Part 2 incorrect due to tripping the Rx and RCP is contingent upon either CBO temperature OR CCW not restored.
- C. Incorrect. Part 1 incorrect, but would be correct if NO radiation alarm was present (step 4.2.7.2.2 of AOP) valve would be placed to OPEN RESET.
- D. Incorrect. Both parts incorrect

Technical Reference(s): 1-AOP-01.09A1, 1A1 RCP (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702824-06 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 5

Comments: :

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 022 AA1.09	
	Importance Rating	3.2	3.3

Ability to operate and/or monitor the following as they apply to the Loss of Reactor Coolant Makeup: RCP seal flows, temperatures, pressures and vibrations

Proposed Question: RO 6

Unit 1 is operating at 100% power.

Which ONE of the following parameters would be an indication of Reactor Coolant System (RCS) leakage from the 1B1 Reactor Coolant Pump (RCP)?

The 1B1 RCP \_\_.

- A. Gasket Leakage annunciator in alarm
- B. Lower and Middle seal pressures fluctuating
- C. Controlled Bleedoff flow rising to 2 gpm
- D. Controlled Bleedoff pressure lowering to 0 psig

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. This gasket works like the Rx Head gasket i.e. when the inner gasket leaks/fails, the outer gasket should hold causing the gap between the two gaskets to pressurize and the alarm comes in.
- B. Incorrect. RCP seal pressure fluctuations are indicative of an RCP seal in the process of failing not RCS leakage (i.e. loss of RCS makeup).
- C. Incorrect. Controlled Bleedoff flow rising to 2 gpm is indicative of 2 RCP seals failing. This should not result in any external RCS leakage (i.e. loss of RCS makeup).
- D. Correct. Controlled Bleedoff Cavity pressure lowering to "0" psig is indicative of a vapor seal failure which allows RCS to leak from the RCP to the Rx Cavity Sump (i.e. loss of RCS makeup).

Technical Reference(s): 0711202-RCP, 1-AOP- (Attach if not previously provided)  
01.09B1, 1B1 RCP  
1-ARP-01-J21

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702202-6, 16 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7  
55.43 \_\_\_\_\_

Comments: ILT 3041, 3973, 153, 3720, 3804 & 4516.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 025 AK2.02	
	Importance Rating	3.2	3.2

Knowledge of the interrelations between the Loss of Residual Heat Removal System and the following: LPI or Decay Heat Removal/RHR pumps

Proposed Question: RO 7

Given the following conditions on Unit 1:

- The unit is currently in Mode 6, shutdown for a refueling outage.
- Time since reactor shutdown is 500 hrs.
- The Reactor Head is being de-tensioned.
- BOTH trains of Shutdown Cooling (SDC) are in service.
- Reactor Coolant System (RCS) temperature is 105° F.
- The RCS level 35 feet.
- A Loss of Offsite Power (LOOP) has just occurred.
- BOTH Emergency Diesel Generators (EDG's) started and loaded onto their respective busses.

1) AT THIS TIME, the LPSI pumps\_\_(1)\_\_\_ .

2) If the LPSI pumps did NOT start, the Time to Boil is approximately\_\_(2)\_\_\_ minutes.

A. 1) require manual re-start after the vital busses are re-energized

2) 30

B. 1) auto started on EDG load sequencing

2) 30

C. 1) require manual re-start after the vital busses are re-energized

2) 41

D. 1) auto started on EDG load sequencing

2) 41

Proposed Answer: A

Explanation (Optional):

- A. Correct. Correct. 30 minutes (core re-load has NOT been complete). LPSI pp's will require a manual re-start.
- B. Incorrect. The LPSI pp does not re-start on the EDG load sequencer.
- C. Incorrect. Time to boil of 41 minutes is if core re-load is complete.
- D. Incorrect Both parts incorrect. The LPSI pp does not re-start on the EDG load sequencer.

Technical Reference(s): 0711501, EDG (Attach if not previously provided)  
1-AOP-03.02, SDC Abnormal  
Ops

Proposed references to be provided to applicants during examination: 1-AOP-03.02  
Attachment 1 & 2

Learning Objective: 0702207-24 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # ILT (Note changes or attach parent)  
980/6240  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 027 AK2.03	
	Importance Rating	2.6	2.8

Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: Controllers and Positioners

Proposed Question: RO 8

Unit 1 is operating at 100% power with the following conditions:

- Pressurizer (Pzr) Pressure controller PIC-1100Y is selected for control.
- The Pzr has been placed on “recirc” in preparation for a downpower.

Pzr Pressure transmitter, PT-1100Y failed high.

Which ONE of the following describes the expected response of the Pressurizer Pressure control system?

Pzr Main Spray valves go fully\_\_(1)\_\_ and ALL Pzr Backup heaters are \_\_(2)\_\_ .

- A. 1) Closed  
2) DE-ENERGIZED
- B. 1) Closed  
2) ENERGIZED
- C. 1) Open  
2) DE-ENERGIZED
- D. 1) Open  
2) ENERGIZED

Proposed Answer: D

Explanation (Optional): If PT-1100Y failed high, it would cause PIC-1100Y output to go to maximum. On Unit-2, a high pressure back up signal (2340 psia) to the back up heaters de-energizes them regardless of switch position.

- A. Incorrect. In this case, the pressure controller (PIC-1100Y) will respond to an erroneous high pressure condition. Max output on the pressure controller causes the spray valves to go full open but to the heater control circuit, max output on the pressure controller drives the output to minimum on the proportional heaters. On Unit 1, there is no high pressure auto de-energization of the back up heaters because with the Pzr on recirc, backup heater control switches would be in the "On" position (not auto). Also on both units, all back up heaters are energized on a high Pzr LEVEL (not pressure) deviation signal.
- B. Incorrect. This describes the exact opposite of what the real response would be (i.e. the pressure controller is responding to an erroneous low pressure condition).
- C. Incorrect. Part 1 correct. Part 2 wrong. Backup heaters would still be energized due to their switches being in "ON"
- D. Correct. With the backup heater switches in the "On" position they will remain on. The spray valves would get a signal to open and proportional heater output would be minimum.

Technical Reference(s): 0711206, Pressurizer Pressure and Level (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702206-18 (As available)

Question Source: Bank # ILT2101  
Modified Bank # (Note changes or attach parent)  
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7  
55.43

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	029 EG2.1.30	
	Importance Rating	4.4	4.0

ATWAS. Ability to locate and operate components, including local controls.

Proposed Question: RO 9

Given the following conditions on Unit 1:

- The turbine automatically tripped due an electrical disturbance on the grid.
- CEA's DID NOT INSERT even after the RCO depressed the reactor trip pushbuttons on the RTGB.

For this event, other than emergency boration, which ONE of the following describes the specific actions to be performed, as necessary, in EOP-01, "SPTA's"?

- 1) manually insert the CEA's at the RTGB  
2) open the Rx Trip Swgr TCB's near the MG Set Control Panels
- 1) open the Rx Trip Swgr TCB's in the Cable Spreading Room  
2) open the CEDM MG Set Load Center Bkr's in the Electrical Swgr Room
- 1) manually insert the CEA's at the RTGB  
2) open both CEDM MG Set contactors in the Electrical Swgr Room
- 1) open the CEDM MG Set Load Center Bkr's in the Cable Spreading Room  
2) open both CEDM MG Set contactors near the MG Set Control Panels

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Part 1 is not a contingency in EOP-01 for Reactivity Control. Part 2 correct.
- B. Correct. These are both contingencies that are listed in EOP-01 for Reactivity Control.
- C. Incorrect. Part 1 is not a contingency in EOP-01 for Reactivity Control. Part 2 is not a contingency in EOP-01 for Reactivity Control.
- D. Incorrect. Part 1 correct. Part 2 not a contingency in EOP-01 for Reactivity Control.

Technical Reference(s): EOP-01- SPTA's , CEN-152- (Attach if not previously provided)  
EOP Bases for CE plants  
0711822 Reactor Trip Recovery

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702822-5, 12 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	EPE 038 EK3.09	
	Importance Rating	4.1	4.5

Knowledge of the reasons for the following responses as they apply to the SGTR: Criteria for securing/throttling ECCS

Proposed Question: RO 10

Given the following conditions on Unit 1:

- The Unit was tripped due to a steam generator tube rupture (SGTR) on the 1A Steam Generator (SG).
- The 1A SG NR level is 71% NR and slowly rising.
- The 1B SG NR level is 62% NR and constant.
- Reactor Coolant System (RCS) pressure is 600 psia and slowly lowering.
- Pressurizer (Pzr) level is 33% and stable.
- RCS Thot is 448°F and stable.
- REP CET temperature is 440°F slowly rising.

For the given conditions, HPSI throttling criteria is \_\_ (1) \_\_.

The reasons for throttling ECCS is \_\_ (2) \_\_.

- A. 1) met  
2) to maintain the RCS Inventory Control and Pressure Control Safety Functions and establish RCS Heat Removal via the SG(s)
- B. 1) NOT met  
2) to maintain the RCS Inventory Control and Pressure Control Safety Functions and establish RCS Heat Removal via the SG(s)
- C. 1) met  
2) to maintain the RCS Inventory Control and Pressure Control Safety Functions and prevent overfilling the ruptured SG due to RCS in-leakage
- D. 1) NOT met  
2) to maintain the RCS Inventory Control and Pressure Control Safety Functions and prevent overfilling the ruptured SG due to RCS in-leakage

Proposed Answer: A

Explanation (Optional):

A. Correct. All ECCS Throttling criteria is met. Part 2 is from CEN 152 SGTR bases document

B. Incorrect. Part 1 wrong, Part 2 correct.

C. Incorrect. Part 1 corect. Part 2 wrong. SG overfill is not part of the throttling criteria bases

D. Incorrect. Both parts wrong.

Technical Reference(s): EOP-04 SGTR, CEN 152, (Attach if not previously provided)  
SGTR

EOP-99, Appdx S, "SI Throttling  
and Restoration"

Proposed references to be provided to applicants during examination: EOP-99 Fig 1A, 1B & 2

Learning Objective: 0702824-12 (As available)

Question Source: Bank # ILT4138  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 5,10  
55.43 \_\_\_\_\_

Comments: ILT 291, 280

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 040 AK1.02	
	Importance Rating	3.2	3.6

Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture: Leak rate versus pressure change

Proposed Question: RO 11

While performing a reactor start up on Unit 2, a Steam Line Rupture occurred on the 2B Steam Generator (SG) upstream of the Main Steam Isolation Valve.

At the onset of the event, the 2A SG depressurizes at a rate determined by the \_\_ (1) \_\_.

Immediately after MSIS actuates, the 2A SG pressure will \_\_ (2) \_\_.

- A. 1) reactor coolant system cooldown  
2) initially increase then lower due to the reactor coolant system cooldown
- B. 1) reactor coolant system cooldown  
2) stabilize due to the rupture being isolated
- C. 1) size of the steam line rupture  
2) initially increase then lower due to the reactor coolant system cooldown
- D. 1) size of the steam line rupture  
2) stabilize due to the rupture being isolated

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Part 1 is incorrect. Due to the design of the Unit 2 MSIV, the 2A SG will blowdown with the ruptured SG since its MSIV has no internal check valve. This would be plausible for Unit 1(a check valve exists along with a valve disk so the unaffected SG would not depressurize at the same rate as the ruptured SG. It would lower based on RCS temperature lowering from the ESDE). Part 2 is correct. When MSIS occurs, the unaffected SG becomes isolated from the ruptured SG so the unaffected SG pressure will initially increase but as the RCS temperature continues to lower from the ESDE (until the ruptured SG dries out), the unaffected SG pressure will lower in response.
- B. Incorrect. Part 1 is incorrect. Part 2 is incorrect.
- C. Correct. Part 1 is correct. Due to the design of the Unit 2 MSIV, the 2A SG will blowdown with the ruptured SG since its MSIV has no internal check valve. Part 2 is correct. When MSIS occurs, the unaffected SG becomes isolated from the ruptured SG so the unaffected SG pressure will initially increase but as the RCS temperature continues to lower from the ESDE (until the ruptured SG dries out), the unaffected SG pressure will lower in response.
- D. Incorrect. Part 1 is correct (See "C"). Part 2 is incorrect (See "C").

Technical Reference(s): CEN 152 ESDE bases (Attach if not previously provided)

0711304, Main Steam

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 0702826 obj. 9, 14 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X \_\_\_\_\_

10 CFR Part 55 Content: 55.41 8, 10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	EPE 055 EA1.06	
	Importance Rating	4.1	4.5

Ability to operate and monitor the following as they apply to a Station Blackout: Restoration of power with one ED/G.

Proposed Question: RO 12

Given the following conditions:

- A Loss of Offsite Power has occurred at the St. Lucie Plant.
- Neither of Unit 1's Emergency Diesel Generators (EDG's) are operating.
- Only the 2A EDG is operating on Unit 2 with the load on the 2A EDG at 2550 kW.
- The 1A3 4.16 kV bus has been energized on Unit 1 by the Unit 2 2A EDG, followed by the 1AB 480V Load Center.
- The 1A Charging (Chg) pump was started on Unit 1 and the 2A Auxiliary Feedwater (AFW) pump was started on Unit 2.
- The load on the 2A EDG is now 3310 kW.

Which of the following is the MOST ADDITIONAL equipment that is allowed to be operated IAW 1-EOP-10, "Station Blackout", EOP-99, Appdx V and EOP-99 Table 11?

(Assume the load start sequence is the order listed in each selection)

References provided

- A. The 1A Battery Charger and the 1A Component Cooling Water pump.
- B. The 1A Battery Charger, the 1C Charging pump, 1 bank of Pressurizer Heaters and Containment Fan Cooler HVS-1A.
- C. The 1A AFW pump and ONE bank of Pressurizer heaters.
- D. The 1A AFW pump, Containment Fan Cooler HVS-1A and the 1C Charging pump.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. 1A Batt Chrg 1<sup>st</sup> = 52kw + 3310kw = 3362kw. To start a CCW pp, the U-2 EDG load must be < 3200kw. Can't start the CCW pp IAW Table 11. Also, with only 1 EDG supplying both units, ICW or CCW pumps can't be started (per EOP-10).
- B. Incorrect. To energize the 1A Batt Chgr 1st, U-2 EDG load < 3750 kw which it is. U-2 EDG load is now 3310kw + 52kw = 3362kw. To start the 1C Chg pp, U-2 EDG load must be < 3650 kw which it is. Total U-2 EDG load now is 71 kw + 3362 kw = 3433 kw. To energize 1 Bank of heaters, U-2 EDG load must be < 3600kw and it is. After energizing heaters, U-2 EDG load = 3433kw + 208 kw = 3641kw. To start a CFC, U-2 EDG load must be < 3600kw which it isn't.
- C. Correct. AFW start 1<sup>st</sup> = 286.3 kw + 3310kw = 3596.3 kw which is < 3600 kw start condition for the heater bank. ALSO, AFW pp = 286.3kw, Htr bank = 208.5 kw (added to the current EDG load of 3596 kw) for a total of 3804 kw which is less than the max load of 3935 kw.
- D. Incorrect. 1A AFW pp 1<sup>st</sup> = 286 kw + 3310 kw = 3596 kw. To start a CFC, U-2 EDG load must be < 3600 kw which it is so after it's started, U-2 EDG load is 3596 kw + 61 kw = 3657 kw. To start a Chg pp, U-2 EDG load must be < 3650 kw which it's NOT.

Technical Reference(s): EOP-10, Eop-99 App. V and Table 11 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: 1/2 EOP-99, Table 11

Learning Objective: 0702830-10 (As available)

Question Source: Bank #  
Modified Bank # ILT 5290 (Note changes or attach parent)  
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7  
55.43

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 056 AA2.14	
	Importance Rating	4.4	4.6

Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Operational status of ED/Gs (A and B).

Proposed Question: RO 13

Given the following conditions:

- A Loss of Offsite Power (LOOP) has occurred on Unit 1
- Both Emergency Diesel Generators (EDG's) started and loaded onto their respective busses
- 30 minutes later, the SNPO reports that the oil pressure on the 1A EDG 16 cylinder engine is 4 psig.
- One minute after the SNPO report, the 1B EDG received a Differential Current trip alarm on the local EDG annunciator panel.

Which ONE of the following describes the status of the 1A and 1B EDG's at this time?

1) The 1A EDG is\_\_\_\_\_.

2) The 1B EDG is\_\_\_\_\_.

A. 1) running  
2) running

B. 1) tripped  
2) running

C. 1) tripped  
2) tripped

D. 1) running  
2) tripped

Proposed Answer: D

Explanation (Optional): The EDG low oil pressure trip is bypassed with an UV start signal present. The EDG differential current trip is NOT bypassed with a UV start signal present.

- A. Incorrect. Part 1 is correct. Part 2 is incorrect.
- B. Incorrect. Part 1 is incorrect. Part 2 incorrect
- C. Incorrect. Part 1 is incorrect. Part 2 is correct
- D. Correct.

Technical Reference(s): 0711501, EDG (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702501-17 & 19 (As available)

Question Source: Bank #  
Modified Bank # ILT 2802 (Note changes or attach parent)  
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41  
55.43 5

Comments: Reworded and re-arranged distractors from exam bank question  
Also consider 3809

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 057AK3.01	
	Importance Rating	4.1	4.4

Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: Actions contained in EOP for loss of vital ac electrical instrument bus.

Proposed Question: RO 14

Unit 1 is in EOP-15 'Functional Recovery' and is not meeting the minimum requirement for 120V Instrument AC busses.

To meet the minimum requirement for 120V Instrument AC busses energize a MINIMUM of ONE 120V Instrument bus from its respective:

- A. DC bus to ensure availability of essential instrumentation used for monitoring and control of other safety functions.
- B. DC bus so channel checks can be performed to monitor and verify safety functions.
- C. maintenance bypass bus to ensure availability of essential instrumentation used for monitoring and control of other safety functions.
- D. maintenance bypass bus so channel checks can be performed to monitor and verify safety functions.

Proposed Answer: A

Explanation (Optional): EOP-15 requires one Vital AC Instrument bus to be energized from its respective DC bus. The body of the procedure (step 2.1 of section 4.2) states ensure at least one 120V AC Instrument bus is energized from its associated DC bus.

Part 2 requiring two buses to be energized so channel checks can be performed is plausible in that the applicant must know the definition of 'Channel Check' i.e. must have two energized channels to compare one another.

Technical Reference(s): CEN 152 , 1-EOP-15, (Attach if not previously provided)  
Functional Recovery  
0711503, 125Vdc, 120 Vital AC  
Power Distribution

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702503-04 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7  
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 058AK1.01	
	Importance Rating	2.8	3.1

Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: Battery Charger Equipment and Instrumentation

Proposed Question: RO 15

Unit 1 is operating at 100% power with the following:

- Annunciators B-10, "125V DC Bus 1A Ground" and A-40, "125V DC Bus 1AB Ground" are in alarm.
- The 1AB DC Bus is aligned to the 1A DC bus.
- The 1AB Battery Charger was placed in service on the 1AB 125V DC Bus in accordance with 1-AOP-50.01, "125V DC Ground Diagnostic".
- When the 1A to 1AB cross tie breakers were opened, the 1AB Battery Charger output breaker tripped.

- 1) Based on the above conditions, what places the station in a Technical Specification ACTION STATEMENT?
- 2) PRIOR to separating the 1AB 125V DC Bus from the 1A 125V DC bus, what indication on the 1AB Battery Charger could be used to diagnose an operational problem with the battery charger?
  - A. 1) 1AB Battery Charger AND AFW PP 1C.  
2) The 1AB Battery Charger ground light indications would be dim while performing a ground test.
  - B. 1) AFW PP 1C ONLY.  
2) The 1AB Battery Charger ground light indications would be dim while performing a ground test.
  - C. 1) 1AB Battery Charger AND AFW PP 1C.  
2) Failure of amps to rise on the 1AB Battery Charger ammeter local indication after the 1AB Battery Charger output breaker was closed onto the 1AB 125V DC bus.
  - D. 1) AFW PP 1C ONLY.  
2) Failure of amps to rise on the 1AB Battery Charger ammeter local indication after the 1AB Battery Charger output breaker was closed onto the 1AB 125V DC bus.

Proposed Answer: D

Explanation (Optional): The 1AB Battery Charger can be used to satisfy the Tech Spec on DC power distribution (Per Ops Policy 503 – Tech Spec guidance) if the 1A (1AA) or 1B (1BB) Battery Chargers become inoperable. The Tech Specs don't specifically list the 1AB Battery Chg in the DC LCO so it would not apply if the 1AB Battery Charger becomes inoperable.

- A. Incorrect. Part 1 wrong. Per the Ground Diagnostic AOP Note, a dim light indicates NO grounds and a BRIGHTLY lit light indicates the presence of a ground. Part 2 wrong since there is no electrical TS (DC bus) for the 1AB Battery Charger.
- B. Incorrect. Part 1 wrong (see "A"). Part 2 correct, the 1C AFW pp TS LCO must be entered.
- C. Incorrect. Part 1 correct. Part 2 wrong (see "A")
- D. Correct. This is a caution in the Ground Diagnostic AOP. Only the 1C AFW TS LCO would apply (until the 1AB DC bus was energized (via cross-tie) by the "A or B" DC bus.

Technical Reference(s): 1-AOP-50.01 125 VDC Ground Diagnostic, 1-AOP-50.08, Loss of 125Vdc Station Battery Chgr (Attach if not previously provided)

Unit 1 Technical Specifications

Ops Policy 503 Tech Spec Guidance

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702503-4,7,8 (As available)

Question Source: Bank #                     

Modified Bank #                      (Note changes or attach parent)

New X

Question History: Last NRC Exam                     

Question Cognitive Level: Memory or Fundamental Knowledge                     

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 8,10

55.43                     

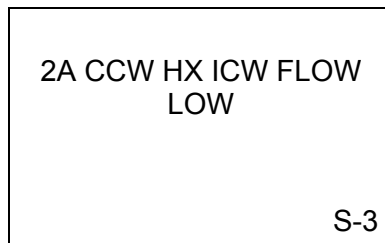
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 062AA2.01	
	Importance Rating	2.9	3.5

Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: Location of a leak in the SWS.

Proposed Question: RO 16

Unit 2 is operating at 100% power when the following alarm occurred:



Which ONE of the following could be the cause of the low flow condition?

- A. A tube rupture in the Component Cooling Water Heat Exchanger has occurred.
- B. HCV-21-7A, "Component Cooling Water HX Strainer Debris Discharge Isolation valve (backwash outlet)" has failed open.
- C. The instrument air line for TCV-14-4A, "A CCW HX Outlet valve" has become disconnected.
- D. Following an inadvertent "A" train SIAS, a rupture occurred at the Intake Cooling Water outlet from the "A" Open Blowdown Heat Exchanger.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. ICW discharge pressure is around 40 psi where CCW header pressure is around 105 psi so CCW would leak into the tube side of the HX which is ICW. ICW flow would not be affected. Not enough flow loss to cause the alarm.
- B. Correct. With the CCW HX inlet strainer backwash valve failed open, ICW flow is diverted from the CCW HX and FIS-21-9A (input to the alarm)
- C. Incorrect. TCV-14-4A fails open on loss of instrument air so ICW flow would increase (i.e. there would be a High ICW flow condition present – not low flow).
- D. Incorrect. MV-21-3 (“A” ICW header train non-essential isolation valve) is closed while backwashing the TCW Hx strainers so ICW flow is isolated.

Technical Reference(s): 0711313, ICW System (Attach if not previously provided)  
2-ARP—01-S3

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702313-6, 9 (As available)

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

Question History: Last NRC Exam                     

Question Cognitive Level: Memory or Fundamental Knowledge                       
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41                       
55.43 5

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	Tier #	1
	Group #	Group #	1
	K/A #	APE 065AA1.04	
	Importance Rating	3.5	3.4

Ability to operate and / or monitor the following as they apply to the Loss of Instrument Air: Emergency Air Compressor

Proposed Question: RO 17

Given the following conditions on Unit 1:

- A Loss of Offsite Power (LOOP) has occurred concurrent with a Loss of Coolant Accident (LOCA).
- 1-EOP-99, Appdendix H, "Operation of the 1A /1B Instrument Air Compressors" has been performed and the 1A and 1B Instrument Air Compressors are running.
- SIAS has just occurred.

Which ONE of the following describes the response of the Emergency Instrument Air Compressors?

The 1A and 1B Instrument Air Compressors \_\_\_\_\_.

- A. will auto start when their designated Emergency Diesel Generator load block times out after load shed
- B. will auto start when the 1A6/1B6 MCC non-essential load breakers are reset
- C. can be manually re-started after the start circuit is reset from the control room
- D. can be manually re-started after the start circuit is reset locally

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. The IA compressors MCC's are powered from the EDG's but the control circuit must be reset first.
- B. Incorrect. The IA compressors MCC's are powered from the EDG's but the control circuit must be reset first.
- C. Incorrect. This would be correct if Unit 2 question
- D. Correct.

Technical Reference(s): 0711413 Instrument Air (Attach if not previously provided)  
1-NOP-18.41, Instrument Air System Operation

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702413-14 (As available)

Question Source: Bank # ILT 6395  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	CE 06EK2.1	
	Importance Rating	3.3	3.7

Knowledge of the interrelations between the (Loss of Feedwater) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Proposed Question: RO 18

Given the following conditions:

- A total loss of feedwater has occurred along with a steam line break downstream of the Main Steam Isolation valves (MSIV's).
- EOP-15 has been entered.
- AFAS and MSIS actuation has occurred.
- Main Feedwater has become available as a source of feedwater.

Which ONE of the following describes ALL the required actions to restore Main Feedwater flow?

- A. On Unit 2, reset MSIS.
- B. On Unit 1, override AFAS.
- C. On Unit 2, override AFAS AND reset MSIS.
- D. On Unit 1, override AFAS AND reset MSIS.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. MSIS would have to be reset but AFAS ALSO has to be reset.
- B. Incorrect. Unit 1 AFAS does NOT close the Main feedwater isolation valves.
- C. Correct
- D. Incorrect. Unit 1 AFAS does NOT close the Main feedwater isolation valves.

Technical Reference(s): EOP-15, 'Functional Recovery' (Attach if not previously provided)

Proposed references to be provided to applicants during examination:

Learning Objective: 0702301-09, 0702827-03 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 7  
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 001AK2.01	
	Importance Rating	2.9	3.2

Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: rod bank step counters.

Proposed Question: RO 19

Unit 1 is performing an up power with the following:

- The Unit Supervisor has directed the RCO to withdraw Group 7 Control Element Assemblies (CEA's) in manual sequential from 124" withdrawn to 127" withdrawn for the power ascension.
- When Group 7 CEA's reached 127" withdrawn, the RCO released the CEA manual control switch but the Group 7 CEA's continued to move outward.

Assuming NO operator actions, which ONE of the following describes the CEA Control Motion Interlock that will stop CEA motion?

Group 7 CEA rod motion will be automatically stopped by the \_\_ (1) \_\_ motion interlock generated from the \_\_ (2) \_\_.

- A. 1) Upper Group Stop  
2) CEA reed switch position transmitters
- B. 1) Upper Group Stop  
2) Distributed Control System
- C. 1) CEA Position Deviation  
2) Distributed Control System
- D. 1) CEA Position Deviation  
2) CEA reed switch position transmitters

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Upper group stop will stop group CEA withdrawal at 133" but the interlock is generated from the pulse counting signals in Distributed Control System not the reed switches.
- B. Correct. The upper group stop will stop CEA group motion. This motion inhibit originates from the DCS-pulse counting system
- C. Incorrect. The CEA Position Deviation will stop CEA motion however the interlock senses CEA position WITHIN the CEA group and stops CEA motion when there is a 5.5" deviation with the CEA group. Part 2 is incorrect since the CEA Position Deviation interlock is generated from the reed switch position indicators. The DCS-pulse counting system also senses individual deviations within the CEA group but if the setpoint is exceeded, only a CEA alarm is generated (7.5" deviation within the CEA group).
- D. Incorrect. Part 1 is incorrect (see "C"). Part 2 is partially correct in that the reed switch position indicator does generate the CEA Position Deviation interlock but the interlock senses CEA position WITHIN the CEA group. As the group continues to withdraw, there should be no individual CEA deviations within the group.

Technical Reference(s): 0711405 - CEAPDS (Attach if not previously provided)

1-ARP-01-K24

Proposed references to be provided to applicants during examination:

Learning Objective: 07024045-15 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41  
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	051 AG2.4.35	
	Importance Rating	3.8	4.0

Loss of Condenser Vacuum. Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects

Proposed Question: RO 20

Unit 2 is operating at 60% power.

Condenser backpressure is 4.5" hg absolute and slowly rising.

The NPO is directed to perform local actions IAW 2-AOP-12.01, 'Loss of Condenser Vacuum'

Which of the following NPO actions could result in Condenser backpressure RISING?

- A. While placing a Hogging Ejector in service by adjusting steam pressure to 200 psig, intermittent steam flow from the Hogging ejector exhaust is observed.
- B. Throttling the Turbine Seal PCV bypass valves to a value of 1.5 to 5.0 psig.
- C. Increasing condensate flow to the Condenser vacuum breakers.
- D. Adjusting PIC-12-29, "SJA E Steam Pressure" to 400 psig steam pressure on the A and B Steam Jet Air Ejectors to maximize efficiency.

Proposed Answer: A

Explanation (Optional):

- A. Correct. This is an indication of ejector 'stalling' as described in the AOP and a possible loss of vacuum. Plausible if the applicant does not know the correct steam pressure and may believe 200 psig is too low. A common confusion factor is the 400 psig to the SJAE vs, 200 psig to the HOGs.
- B. Incorrect. This is the normal pressure for the gland seals
- C. Incorrect. Condensate is normally supplied to the vacuum breakers as sealing water and is periodically adjusted to these valves.
- D. Incorrect. 400 psig is the normal steam pressure to the SJAE.

Technical Reference(s): 0711301 (Attach if not previously provided)

2-AOP-12.01 Loss of  
Condenser Vacuum

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702301-18 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 10  
55.43 5

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 060AK2.01	
	Importance Rating	2.6	2.9

Knowledge of the interrelations between the Accidental Gaseous Radwaste Release and the following: ARM system, including the normal radiation level indications and the operability status.

Proposed Question: RO 21

A Waste gas release is in progress IAW OP 1-0530021, "Controlled Gaseous Batch Release to Atmosphere".

- 1) The Blue 'Fail' light on Channel 42 'Gaseous Waste Radiation Monitor' should remain \_\_\_(1)\_\_\_ to be considered operable.
  - 2) The gas release is required to be manually terminated if \_\_\_(2)\_\_\_
- A. 1) de-energized  
2) the non-releasing Gas Decay tanks exhibits a pressure decrease of 2 psig over a 12 hour period
  - B. 1) de-energized  
2) a High Alarm condition is received on an Plant Vent Radiation Monitor Channel
  - C. 1) energized  
2) the non-releasing Gas Decay tanks exhibits a pressure decrease of 2 psig over a 12 hour period
  - D. 1) energized  
2) a High Alarm condition is received on an Plant Vent Radiation Monitor Channel

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. The BLUE fail light on the Waste Gas Rad Monitor is normally lit when the rad monitor is functional. The only auto action from the waste gas rad monitor is to auto close V6565 on high radiation. Part 2 limit is 4 psig or more.
- B. Incorrect. The BLUE fail light on the Waste Gas Rad Monitor is normally lit when the rad monitor is functional. Part 2 is correct.
- C. Incorrect. The BLUE fail light on the Waste Gas Rad Monitor is normally lit when the rad monitor is functional. The only auto action from the waste gas rad monitor is to auto close V6565 on high radiation. Part 2 limit is 4 psig or more.
- D. Correct. The BLUE fail light on the Waste Gas Rad Monitor is normally lit when the rad monitor is functional. This is a requirement in the Limits and Precautions of AOP-26.01

Technical Reference(s): 1-AOP-26.01, Process Radiation Monitors (Attach if not previously provided)  
1-0530021, Controlled Gas Release to Atmosphere

Proposed references to be provided to applicants during examination:

Learning Objective: 0702410-5, 12.d (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7  
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 061AK1.01	
	Importance Rating	2.5	2.9

Knowledge of the operational implications of the following concepts as they apply to Area Radiation Monitoring (ARM) System  
Alarms: Detector limitations

Proposed Question: RO 22

Which ONE of the following describes:

- 1) The type of detector that is used for local Area Radiation Monitors AND
  - 2) The operational implications associated with the detector limitation(s)?
- A. 1) GM-tube.  
2) In low radiation fields, the detector output signal is weak thereby requiring amplification before being sent to the ratemeter / alarm electronic circuit. A noise problem could develop from the amplification which may lead to a higher than actual radiation indication.
  - B. 1) Ion Chamber.  
2) In low radiation fields, the detector output signal is weak thereby requiring amplification before being sent to the ratemeter / alarm electronic circuit. A noise problem could develop from the amplification which may lead to a higher than actual radiation indication.
  - C. 1) GM-tube.  
2) A weak ionizing event produces the same output as a much stronger ionizing event so if the detector is in a strong radiation field, it will become saturated. This may lead to a lower than actual radiation indication.
  - D. 1) Ion Chamber.  
2) A weak ionizing event produces the same output as a much stronger ionizing event so if the detector is in a strong radiation field, it will become saturated. This may lead to a lower than actual radiation indication.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Part 1 correct. Part 2 is correct for an Ion Chamber detector
- B. Incorrect. Part 1 incorrect. Part 2 incorrect (see "A")
- C. Correct. The higher the radiological field, the longer the dead time (i.e. no radiation is detected) and less reliable indications. G-M tubes should not be used in high radiation fields. The radiation field for the MSL would be small (SGTL detection).
- D. Incorrect. Part 1 incorrect. Part 2 correct.

Technical Reference(s): 0711410- Unit 1 RMS (Attach if not previously provided)  
0702193 Radiation detectors

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702193-18, 19 (As available)

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

Question History: Last NRC Exam                     

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis                     

10 CFR Part 55 Content: 55.41 8,10  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 067 AK3.02	
	Importance Rating	2.5	3.3

Knowledge of the reasons for the following responses as they apply to the Plant Fire on Site: Steps called out in the site fire protection plan, FPS manual and fire zone manual

Proposed Question: RO 23

A Fire Watch patrol has been assigned to a specific fire zone, to monitor once per hour on Unit 2.

Which ONE of the following describes the Fire Protection Feature(s) that is (are) inoperable?

The \_\_\_\_\_ is inoperable.

- A. fixed water spray system for the 2A and 2B Startup Transformers
- B. pre-action sprinkler system for the Cable Spread room (43.0' elev. RAB)
- C. fire door that separates the "A" and "B" Electrical Switchgear rooms (43.0' elev. RAB)
- D. minimum required amount of fire detection instrumentation for the Fuel Handling Building New Fuel Area

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Inoperable "OTHER" fire suppression system - contact Fire Protection supervisor for compensatory action.
- B. Incorrect. Inoperable REQUIRED fire suppression system. Compensatory action is within 1 hour, establish a continuous fire watch with back up fire suppression equipment for those areas in which redundant Appdx R safe shutdown train-related systems or components could be damaged.
- C. Incorrect. Inoperable Fire Detection Instrumentation system. Compensatory action is within 1 hour, establish a fire watch to inspect the fire zone at least once per 8 hours
- D. Correct. Inoperable Fire Detection Instrumentation system. Compensatory action is within 1 hour, establish a fire watch to inspect the fire zone at least once an hour

Technical Reference(s): AP 1800022 Fire Protection Plan (Attach if not previously provided)  
2-AP-1800023 Fire fighting Strategies

Proposed references to be provided to applicants during examination:

Learning Objective: 0902712-35 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 5,10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	068 AA1.12	
	Importance Rating	4.4	4.4

Ability to operate and / or monitor the following as they apply to the Control Room Evacuation: Auxiliary shutdown panel controls and indicators

Proposed Question: RO 24

Given the following:

- Unit 2 has evacuated the Control Room due to the presence of toxic fumes
- All Operator actions in the Control Room were performed prior to evacuation.
- Critical actions from Appendix A through D of 2-ONP-100.02 "Control Room Inaccessibility" have been completed
- RCO A is maintaining Hot Standby conditions at the Remote Shutdown Panel

Which ONE of the following describes how RCS pressure is controlled and how subcooling is monitored?

Control pressurizer pressure between 1800 and 1850 psia by operating Auxiliary Spray valves along with \_\_\_\_ (1) \_\_\_\_.

Determine subcooling margin using 2-ONP-100.02 "Control Room Inaccessibility", Figure 1 using Reactor Coolant System \_\_\_\_ (2) \_\_\_\_ and Pressurizer pressure.

- A. 1) Proportional and backup heaters  
2) T-hot
- B. 1) backup heaters ONLY  
2) T-cold + 50°F
- C. 1) Proportional and backup heaters  
2) T-cold + 50°F
- D. 1) backup heaters ONLY  
2) T-hot

Proposed Answer: B

Explanation (Optional):

A. Incorrect. No proportional heater control on the HSDCP. Also, there's no value for  $T_{hot}$  displayed on the HSDCP - must use  $T_{cold} + 50^{\circ}\text{F}$  to determine subcooling.

A. Correct.

B. Incorrect. No proportional heater control on the HSDCP

D. Incorrect. Also, there's no value for  $T_{hot}$  displayed on the HSDCP - must use  $T_{cold} + 50^{\circ}\text{F}$  to determine subcooling.

Technical Reference(s): 2-0NP-100.02 Control Room Inaccessibility (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702846-01.b (As available)

Question Source: Bank #  
Modified Bank # 4193 (Note changes or attach parent)  
New

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 7  
55.43

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 069 AK1.01	
	Importance Rating	2.6	3.1

Knowledge of the operational implications of the following concepts as they apply to Loss of Containment Integrity: Effect of pressure on leak rate

Proposed Question: RO 25

A Large Break LOCA has occurred on Unit 1. Onsite and offsite doses are higher than expected. It is suspected that a breach of Containment has occurred.

Containment pressure is currently 35 psig.

Which ONE of the following would have the LARGEST effect on reducing the Containment leak rate?

Reduce:

- A. the energy release into the Containment by cooling down the RCS at maximum allowable rate by maximizing ECCS flow.
- B. the energy release into the Containment by cooling down the RCS at maximum allowable rate by maximizing SG steaming and feeding.
- C. Containment pressure by ensuring all available Hydrogen Purge and Shield Building Ventilation systems are operating.
- D. Containment temperature by ensuring all available Containment coolers and Containment Spray pumps are operating.

Proposed Answer: D

Explanation (Optional):

- A. Cooling down the RCS will reduce the energy release in the Containment but that is not the largest effect to reduce the leakrate.
- B. The SG's have little effect on RCS cooling / removing energy from the RCS due to the SG's are largely 'uncoupled' from the RCS on a LBLOCA.
- C. Operating the Hydrogen purge will reduce the Containment pressure but not the largest effect.
- D. Correct, reducing Containment temperature will reduce the pressure. Coolers and Spray will have the largest effect.

Technical Reference(s): EPIP-09, Off-Site Dose Calc (Attach if not previously provided)

0711824, LOCA Event

Proposed references to be provided to applicants during examination:

Learning Objective: 0702600-4, 12, 18 and 21 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 8, 10  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>076AA2.03</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>3</u>

Ability to determine and interpret the following as they apply to the High Reactor Coolant Activity: RCS radioactivity level meter

Proposed Question: RO 26

Which ONE of the following Unit 1 Letdown Monitor radiation trends would be indicative of fuel failure?

- A. Iodine increase that remains significantly above prior levels during steady state operation.
- B. Iodine increase that remains significantly above prior levels during a plant load change.
- C. Iodine remains constant concurrent with a gross activity increase during a plant load change.
- D. Iodine remains constant while gross activity increases during steady state operation.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Correct monitor indication, plant condition incorrect
- C. Indication of a crud burst
- D. Correct plant condition, incorrect monitor indication

Technical Reference(s): 1-AOP-01.06 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702410-12.f (As available)

Question Source: Bank # QID 4188  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 43.5  
45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	CE09EA2.2	
	Importance Rating	3.5	4

Functional Recovery: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: RO 27

Unit 1 is in 1-EOP-15, 'Functional Recovery' due to Feedwater problems. Which ONE of the following states when Once Through Cooling (OTC) is to be initiated?

- A.  $T_{\text{COLD}}$  rises 5°F with all ADV's fully open.
- B.  $T_{\text{HOT}}$  rises 5°F with all ADV's fully open.
- C. The 1A wide range SG level indicates 14% and the 1B wide range SG level indicates 16%.
- D. Both SG wide range levels indicate 15% with MAXIMUM available feedwater flow of 150 gpm.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Correct parameter is  $T_{\text{COLD}}$  not  $T_{\text{HOT}}$
- C. Both SG wide range level criteria is <15%
- D. Level criteria is <15% regardless of available feedwater flow. 150 gpm feedwater flow rate is initial required flow rate when feedwater restored after total loss of feedwater.

Technical Reference(s): 1-EOP-15, 'Functional Recovery' (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702828-7 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 43.5 \_\_\_\_\_  
45.13 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	003K5.04	
	Importance Rating	3.2	3.5

Knowledge of the operational implications of the following concepts as they apply to the RCPS: Effects of RCP shutdown on secondary parameters, such as steam pressure, steam flow, and feed flow

Proposed Question: RO 28

Given the following on Unit 2:

- Unit was at 100% power for 210 days when a trip occurred.
- Unit is offline for 12 hours with RCS at normal operating temperature and pressure.
- One ADV on each Steam Generator is in manual control from the controller.
- AFW flow to each SG is 110 gpm.

A loss of CCW occurs requiring all RCP's to be stopped. Ten (10) minutes after stopping the RCP's, which of the following would be expected? (assume NO Operator actions)

SG pressure:

- A. lowers. AFW flow remains the same.
- B. rises. AFW flow lowers.
- C. lowers. AFW flow rises.
- D. rises. AFW flow remains the same.

Proposed Answer: B

Explanation (Optional):

- A. SG pressure lowering is plausible if the applicant thought loss of RCP pump heat caused the SG pressures to lower and disregarded decay heat. The AFW pumps are centrifugal pumps and the head curve follows SG pressures. (lower SG pressure, higher AFW flow)
- B. Correct. SG pressures will rise as  $T_{hot}$  rises due to natural circ developing. AFW flow will lower due to the head curve of the pump.
- C. SG pressure lowering is plausible if the applicant thought loss of RCP pump heat caused the SG pressures to lower and disregarded decay heat. If SG pressures indeed lowered, AFW flow would rise.
- D. SG pressure rising is correct. AFW remaining the same is plausible if the applicant did not understand the pump head curve. i.e. thought positive displacement pump.

Technical Reference(s): LP 0702134 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702134-11,12 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.5  
45.7

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>003K6.14</u>	<u>          </u>
	Importance Rating	<u>2.6</u>	<u>2.9</u>

Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Starting requirements

Proposed Question: RO 29

Unit 2 is in Mode 3 at 1810 psia and 502°F Tave. with three RCP's operating.

- The 2A2 RCP has just been started.

Which of the following would require an IMMEDIATE stopping of the 2A2 RCP?

- A. Upper seal cavity pressure indicates 600 psia.
- B. Lower seal cavity temperature indicates 305°F.
- C. Controlled bleedoff flow indicates 2 gallons per minute.
- D. RCS pressure drops 30 psia below the minimum RCS pressure for RCP operation.

Proposed Answer: B

Explanation (Optional):

- A. 600 psia is the normal Upper Seal cavity pressure for the given RCS pressure.
- B. Correct. Lower seal cavity can be up to 250°F but 300°F requires the pump to be stopped.
- C. Bleedoff flow is above normal (1-1.5 gpm but below the requirement to trip the pump which is >3 gpm)
- D. RCS pressure can drop below minimum for RCP operation provided it is restored within 30 minutes.

Technical Reference(s): 2-NOP-01.02, 'Reactor Coolant Pu+mp Operation' (Attach if not previously provided)

2-NOP-01.02, 'Reactor Coolant Pump Operation'

2-AOP-01.09A '2A2 RCP'

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: \_\_\_\_\_ (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X \_\_\_\_\_

10 CFR Part 55 Content: 41.7 \_\_\_\_\_  
45.5 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>004K5.26</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>3.2</u>

Knowledge of the operational implications of the following concepts as they apply to the CVCS: Relationship between VCT pressure and NPSH for charging pumps

Proposed Question: RO 30

Unit 1 is operating at 100% power.

Which ONE of the following conditions could result in the Charging Pump(s) not meeting the design Net Positive Suction Head?

(assume NO Operator actions)

Volume Control Tank:

- A. pressure lowers to 10 psig.
- B. level lowers to 10% level.
- C. level transmitter LT2227 failing LOW.
- D. level transmitter LT2227 failing HIGH.

Proposed Answer: D

Explanation (Optional):

- A. Normal VCT pressure band is 15-30 psig, 10 PSIG plus elevation of VCT above Charging pumps is well above the required NPSH of the Charging pumps which is 9 psia. (trip at 10 psia)
- B. VCT design level of >5% meets the NPSH of the Charging pumps.
- C. LT 2227 failing low would result in VCT outlet closing and RWT outlet to Charging pump suction opening.
- D. Correct, letdown divert valve opens, VCT actual level lowers but indicated level has failed high. As a result VCT is pumped dry and Charging pumps will become gas bound.

Technical Reference(s): PSL OPS 0711205 (Attach if not previously provided)  
2-AOP-02.03, Charging and  
Letdown

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702205-7 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.5  
45.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	004K6.17	
	Importance Rating	4.4	4.6

Knowledge of the effect of a loss or malfunction on the following CVCS components:: Flow paths for emergency boration

Proposed Question: RO 31

Unit 1 has tripped due to a LOOP. Both Emergency Diesel Generators (EDG) started and loaded on their respective busses, however the feeder breaker to the 1B5 MCC tripped opened when the 1B EDG output breaker closed.

On the trip three CEA's failed to fully insert.

Which ONE of the following states the available emergency boration flowpath?

Charging pump suction aligned from the:

- A. RWT isolation, V2504.
- B. BAMT's through the Gravity feed isolations, V2508 and V2509.
- C. discharge of 'A' OR 'B' BAM pump through the emergency borate valve MV-2514.
- D. discharge of ONLY the 'A' BAM pump through the emergency borate valve MV-2514.

Proposed Answer: C

Explanation (Optional):

- A. V2504 is 'B' powered
- B. V2508 and V2509 are 'B' powered
- C. Correct, BOTH BAM pumps are 'A' powered along with MV-2514.
- D. Plausible if applicant believes electrical train separation similar to ECCS pumps in that 'A' is powered from 'A' side and 'B' powered from 'B' side.

Technical Reference(s): 1-ADM-03.01C Power Distribution Breaker List. (Attach if not previously provided)

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PSL OPS 0702205

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702205-5 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge      X  
Comprehension or Analysis

10 CFR Part 55 Content:	<u>41.7</u>
	45.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>005K6.03</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>2.6</u>

Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger

Proposed Question: RO 32

Unit 1 has just placed SDC in service and is cooling down at 30°F / hour.

A loss of Instrument air occurs and air pressure indicates 20 psig.

Which ONE of the following states the effect on RCS temperature on the loss of instrument air?  
(assuming NO Operator actions)

RCS temperature will:

- A. lower due to TCV-14-4A, 1A CCW HX Outlet and TCV-14-4B, 1B CCW HX Outlet going full OPEN.
- B. lower due to HCV-14-3A, CCW to Shutdown HX 1A and HCV-14-3B, CCW to Shutdown HX 1B going full OPEN.
- C. rise due to FCV-3306, SDC Return Flow, going full CLOSED.
- D. rise due to HCV-3657, SDC TEMP Control, going full CLOSED.

Proposed Answer: D

Explanation (Optional):

- A. TCV's going full OPEN is correct, however SDC flow through the SDC HX is terminated by HCV-3657 going full closed.
- B. HCV's going full OPEN is correct, however SDC flow through the SDC HX is terminated by HCV-3657 going full closed.
- C. FCV-3306 goes full OPEN not closed.
- D. Correct

Technical Reference(s): 1-AOP-18.01, Instrument Air Malfunction. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702860-3

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.7  
45.7

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>006A2.06</u>	<u>          </u>
	Importance Rating	<u>3.3</u>	<u>3.5</u>

Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Water Hammer

Proposed Question: RO 33

Unit 1 is on Shutdown cooling with the following conditions:

- RCS temperature is 105°F
- RCS level is 41 feet.
- The 1A LPSI pump is aligned for SDC and the 1B LPSI pump is in standby.
- The RCS is being drained to the 34 foot level via the 1A LPSI pump recirc, V3204, at a rate of 50 gpm.
- SDC flow is 3450 gpm.

It is desired to increase the drain down rate to 100 gpm.

Which ONE of the following states the actions needed to raise the drain down flow rate, to drain from 41 feet to 34 feet, and the bases for these actions?

Throttle open V3204, 1A LPSI pump recirc. to the RWT, and reduce SDC flow to no more than:

- A. 3160 gpm. This is the minimum SDC flow that will limit the RCS from heating up.
- B. 3400 gpm. This is the minimum SDC flow that will limit the RCS from heating up.
- C. 3160 gpm. This is the maximum LPSI flow requirements to prevent suction line voiding and possible water hammer.
- D. 3400 gpm. This is the maximum LPSI flow requirements to prevent suction line voiding and possible water hammer.

Proposed Answer: C

Precaution (page 5, step 2.1.1) from 1-NOP-03.06, 'Filling and Draining the RCS and Refueling Cavity Using LPSI':

NOTE: 3400 gpm was chosen based on the original given flow of 3450 and 50 gpm drain down. Increasing drain down to 100 (+50 gpm) and reducing SDC flow by 50 gpm equals 3400 gpm.

Technical Reference(s):	1-NOP-03.06, Filling and Draining the RCS and Refueling Cavity Using LPSI.	(Attach if not previously provided)
	1-NOP-03.05, Shutdown Cooling	

Proposed references to be provided to applicants during examination: Attachment 3 of 1-NOP-03.06, Filling and Draining the RCS and Refueling Cavity Using LPSI.

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

Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>
	Comprehension or Analysis	X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	006A2.11	
	Importance Rating	4.0	4.4

Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Rupture of ECCS header

Proposed Question: RO 34

Unit 2 has tripped from 100% power due to a Main Feedwater problem. The following conditions exist:

- Pressurizer level is 22% and slowly lowering.
- RCS  $T_{AVE}$  is 530°F and stable.
- 2A and 2B Charging pumps are running with Charging header pressure indicating 420 psia.
- Reactor cavity leakage recorder is off scale high.

Which of the following states the Operator actions and the appropriate procedure implementation?

- Start the 2C Charging pump in addition to the 2A and 2B Charging pumps to restore Pressurizer level to 27-35%. Implement 2-AOP-01.06, 'Excessive RCS Leakage'.
- Start the 2C Charging pump in addition to the 2A and 2B Charging pumps and align to the A HPSI Header IAW 2-AOP-02.03, 'Charging and Letdown' Attachment 2, 'Alternate Charging Flow Path Through the A HPSI Header'.
- Stop the 2A and 2B Charging pumps and align the 2A or 2B Charging pump to the A HPSI header IAW 2-AOP-02.03, 'Charging and Letdown' Attachment 2, 'Alternate Charging Flow Path Through the A HPSI Header'.
- Stop the 2A and 2B Charging pumps and start the 2C Charging pump to restore Pressurizer level to 27-35%. Implement 2-AOP-01.06, 'Excessive RCS Leakage'.

Proposed Answer: C

Explanation (Optional): **NOTE: On Unit 2, the Charging system is considered part of ECCS subsystem IAW T.S. 3.5.2.**

- A. Because the Charging header pressure is low and Pzr. Pressure, level and temperature are stable, starting the 2C Charging pump is not correct due to the charging header pressure much below normal and cavity leakage indicating off scale high. Implementing the RCS leakage procedure is also not correct. Even though reactor cavity leakage recorder is pegged high other indications show no sign of RCS leakage.
- B. Aligning the 2C Charging pump to the A HPSI header is not correct. The 2C Charging pump is aligned to the A HPSI header ONLY if the charging header break is UPSTREAM of the charging pump dish. at the containment penetration. As indicated by the reactor cavity leakage recorder pegged high, the charging header break is in the containment, DOWNSTREAM of the penetration.
- C. Correct
- D. Starting the 2C Charging pump is not correct and the procedure implementation is not correct.

Technical Reference(s):    2-AOP-02.03, Charging and                      (Attach if not previously provided)  
   Letdown.  
   PSL OPS 0702859

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective:            PSL OPS 0702859-3,4                      (As available)

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

Question History:              Last NRC Exam                      \_\_\_\_\_

Question Cognitive Level:    Memory or Fundamental Knowledge                      \_\_\_\_\_  
   Comprehension or Analysis                      X

10 CFR Part 55 Content:                      41.5  
   45.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	007G2.2.44	
	Importance Rating	4.2	4.4

Pressurizer Relief Tank/Quench Tank System (PRTS): Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

Proposed Question: RO 35

Unit 1 is implementing 1-EOP-02, 'Reactor Trip Recovery' due to an inadvertent SIAS.

Thirty (30) minutes into the event the Quench Tank High level alarm is received.

Which ONE of the following states the most likely reason for the Quench Tank high level alarm?

- A. Operator actions have aligned the alternate RCP bleedoff flow.
- B. CIAS has aligned the alternate RCP bleedoff flow.
- C. Pressurizer relief or Safety valve leakage.
- D. Quench Tank cooling heat exchanger has developed a leak.

Proposed Answer: A

Explanation (Optional):

- A. Correct, CCW is restored to the RCP's on an inadvertent SIAS IAW Appendix J of EOP-99. Step 2.C. Appendix J also directs V2507, RCP bleedoff relief stop opened which aligns RCP bleedoff to the Quench Tank due to CIAS isolating the normal RCP bleedoff.
- B. CIAS will close the normal RCP bleedoff but manual operator actions are necessary to align the alternate RCP bleedoff to the quench tank.
- C. Plausible but only the quench tank high level alarm came in. If Safety or PORV leaked the quench tank high temperature alarm would be expected before the high level alarm.
- D. Plausible if applicant thought the quench tank cooling system was internal to the tank. The system is external to the tank, not internal.

Technical Reference(s): 1-EOP-02, 'Reactor Trip Recovery' step 9.A. (Attach if not previously provided)

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1-EOP-99 Appendix J

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702822-08 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>
	Comprehension or Analysis	X

10 CFR Part 55 Content: \_\_\_\_\_  
41.5 / 43.5 / 45.12

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>007K1.01</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>3.1</u>

Knowledge of the physical connections and/or cause effect relationships between the PRTS and the following systems:  
Containment system

Proposed Question: RO 36

On Unit 1, which ONE of the following Quench Tank conditions could result is increasing radioactivity to the Containment atmosphere during a Quench Tank design event?

Quench Tank:

- A. pressure is allowed to lower to 0.9 psig.
- B. temperature is allowed to rise to 117°F.
- C. temperature is allowed to lower to 110°F.
- D. level is allowed to lower to 38%.

Proposed Answer: D

Explanation (Optional):

NOTE: QT relief to Containment atmosphere setpoint is 70 psig and rupture disc. setpoint is 100 psig.

- A. Lowering pressure to <1 psig could increase the possibility of PORV / Safety valve leakage but not result in QT safety or rupture disc. blow out.
- B. Temperature rise to 117°F is below the limit of 120°F.
- C. Temperature lowering to 110°F could result in PORV / Safety valve leakage.
- D. Correct. Level band of 55-65% ensures QT rupture disc. blow out pressure is not exceeded. 38% is below the QT inlet sparger which would result in the QT relief / rupture disc blow out if PORV's lifted.

Technical Reference(s): 1-NOP-01.07, Quench Tank Operation. (Attach if not previously provided)  
PSL OPS 0702206

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702206-9b (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: \_\_\_\_\_  
41.2 to 41.9 / 45.7 to 45.8 \_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>008.K4.02</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>2.7</u>

Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: Operation of the surge tank, including the associated valves and controls

Proposed Question: RO 37

Given the following conditions:

- A steam generator tube leak has occurred on Unit 2
- During the downpower, the CCW “N” header developed a leak
- After the “N” header automatically isolated, the operators manually tripped the reactor and turbine
- The “N” header leak has been isolated
- LA-10, “CCW SURGE TANK COMPARTMENT A LEVEL LOW,” locked in
- LB-10, “CCW SURGE TANK LEVEL HIGH/COMPARTMENT B LEVEL LOW,” locked in
- Chemistry has requested that cooling be restored to the sample heat exchangers to allow S/G samples to be taken

Based on the above conditions, which ONE of the following describes the MINIMUM action(s)/conditions that must occur to open the CCW “N” header isolation valves?

The CCW “N” header valves:

- A. will open if the control switches are placed in “closed/override” and then placed in “open”.
- B. can be locally opened by failing the air supply to the valves.
- C. will open if the control switches are placed in the “open” position.
- D. cannot be opened until level is restored to the surge tank.

Proposed Answer: D

Explanation (Optional):

- A. Correct for SIAS signal, not for low level
- B. Valves fail closed on loss of air
- C. Correct for Unit 1 SIAS signal
- D. Correct

Technical Reference(s): 0711209 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702209-4 (As available)

Question Source: Bank # QID 5674  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.7  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>010K1.01</u>	<u>          </u>
	Importance Rating	<u>3.9</u>	<u>4.1</u>

Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the following systems: RPS

Proposed Question: RO 38

On Unit 2, which ONE of the following states how the Pressurizer PORV open signal is achieved when the PORV selector switch is in:

- 1) NORMAL RANGE
- 2) LTOP

Directly from the:

- A. 1) RPS high pressure trip bistables.  
2) Pressurizer pressure instruments PT-1103, 1104
- B. 1) Pressurizer pressure instruments PT-1102 A-D  
2) Pressurizer pressure instruments PT-1102 A-D
- C. 1) RPS high pressure trip bistables.  
2) Pressurizer pressure instruments PT-1102 A-D
- D. 1) Pressurizer pressure instruments PT-1102 A-D  
2) Pressurizer pressure instruments PT-1103, 1104

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Open signal is directly from RPS high pressure bistables generated from PT-1102 A-D.  
LTOP open signal is from different Pressure Transmitters (PT-1103, 1104)
- C. Part one correct but part 2 incorrect Pressure Transmitters
- D. Both parts incorrect

Technical Reference(s): 0711206 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702206-4 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: \_\_\_\_\_  
41.2 to 41.9 / 45.7 to 45.8 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>012.A2.07</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>3.7</u>

Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of dc control power

Proposed Question: RO 39

Unit 1 is at 100% power with the following:

The DC power supply to ONE RPS K Relay has failed (de-energized).

Which ONE of the following states:

- 1) The number of TCB's that has opened?
  - 2) The procedure that CAN be used to close the TCB's when the fault is corrected?
- 
- A. 1) 2 Trip Circuit Breakers (TCB's open)  
2) 1-AOP-49.02, '120V INSTRUMENT AC SYSTEM (CLASS 1E)'
  - B. 1) 2 Trip Circuit Breakers (TCB's open)  
2) 1-AOP-50.07A(B) LOSS OF OR DEGRADED SAFETY RELATED DC BUS 1A (1B)
  - C. 1) 4 Trip Circuit Breakers (TCB's open)  
2) 1-AOP-49.02, '120V INSTRUMENT AC SYSTEM (CLASS 1E)'
  - D. 1) 4 Trip Circuit Breakers (TCB's open)  
2) 1-AOP-50.07A(B) LOSS OF OR DEGRADED SAFETY RELATED DC BUS 1A (1B)

Proposed Answer: A

Explanation (Optional):

- A. Correct, two TCB's open. There is no RPS 'AOP' for RPS specific malfunctions. The 120V Vital AC AOP is written assuming a loss of the entire Vital AC bus in which 4 TCB's would open. This AOP has guidance for re-closing those TCB's in a separate attachment.
- B. Procedure incorrect. A loss of DC bus will result in Plant trip. Procedure does not have guidance for re-closing TCB's.
- C. 4 TCB's opening incorrect.
- D. 4 TCB's opening incorrect.

Technical Reference(s): PSL OPS 0711404 (Attach if not previously provided)  
1-AOP-49.02

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702404-7 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: \_\_\_\_\_  
41.5 / 43.5 / 45.3 / 45.5 \_\_\_\_\_

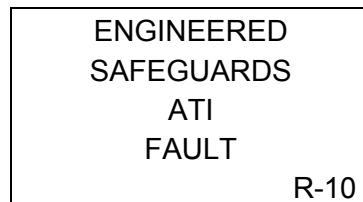
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	013.K5.02	
	Importance Rating	2.9	3.3

Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability

Proposed Question: RO 40

Unit 1 is at 100% power when the following SINGLE annunciator is received:



Upon observation of the ESFAS panel, it is observed the Containment Pressure individual ATI Test Panel light is NOT illuminating during the test sequence.

Which ONE of the following states:

- 1) the significance of the observation.
  - 2) the actuation logic sequence for SIAS on high Containment pressure.
- A. 1) The Containment pressure bistable did not trip at 5% ABOVE setpoint during the testing sequence.  
2) SIAS on high Containment pressure is 1/3 logic
  - B. 1) The Containment pressure bistable did not trip at 5% ABOVE setpoint during the testing sequence.  
2) SIAS on high Containment pressure is 2/4 logic
  - C. 1) The Containment pressure bistable tripped at 5% BELOW setpoint during the testing sequence.  
2) SIAS on high Containment pressure is 1/3 logic
  - D. 1) The Containment pressure bistable tripped at 5% BELOW setpoint during the testing sequence.  
2) SIAS on high Containment pressure is 2/4 logic

Proposed Answer: D

Explanation (Optional):

- A. ATI light NOT illuminating indicates bistable did not trip at 5% below setpoint, Because the stem of the question stated no other annunciators, the Containment pressure instrument in question would still trip on high Containment pressure but may be out of calibration. The logic remains 2/4.
- B. Trip Logic correct, bistable fault not correct
- C. Trip Logic incorrect
- D. Correct.

Technical Reference(s): Lesson Text 0702401 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702401-13,17 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.5  
45.7

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>022K2.01</u>	<u>          </u>
	Importance Rating	<u>3.0</u>	<u>3.1</u>

Knowledge of power supplies to the following: Containment cooling fans

Proposed Question: RO 41

Unit 2 has experienced a LOCA. RCS pressure is 1580 psia and the crew has entered 2-EOP-03, 'LOCA'.

On the trip, feeder breakers to MCC 2B9 tripped.

Which ONE of the following states the RUNNING Containment Fan Coolers?

- A. C and D Containment Fan Coolers.
- B. A and C Containment Fan Coolers.
- C. A and B Containment Fan Coolers.
- D. B and D Containment Fan Coolers.

Proposed Answer: C

Explanation (Optional):

- A. MCC 2B9 supplies Containment fans coolers 1C and 1D.
- B. Plausible, as the 'B' 120V DC bus supplies 'B' and 'D' instrument inverters.
- C. Correct
- D. Plausible, as the 'B' 120V DC bus supplies 'B' and 'D' instrument inverters.

Technical Reference(s): 0711502 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702210 Obj. 7b, 14a (As available)

Question Source:	Bank #	Last NRC exam (Q-40)	
	Modified Bank #	_____	(Note changes or attach parent)
	New	_____	

Question History:	Last NRC Exam	<u>Question 40</u>
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Question Cognitive Level:	Memory or Fundamental Knowledge	<u>X</u>
	Comprehension or Analysis	_____

10 CFR Part 55 Content: 41.7  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>022K3.01</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>3.2</u>

Knowledge of the effect that a loss or malfunction of the CCS will have on the following: Containment equipment subject to damage by high or low temperature, humidity, and pressure

Proposed Question: RO 42

Unit 1 is at 100% power with CEDM cooling fan HVE -21B out of service and HVE-21A running.

HVE-21A trips and cannot be started.

Which ONE of the following states the time to restore a CEDM cooling fan and the basis for this time?

Restore a CEDM cooling fan within:

- A. 45 minutes to limit the possibility of dropping CEA's due to overheated CEDM coils.
- B. 45 minutes to prevent the reactor vessel support structure from exceeding its design limits.
- C. 5 hours to limit the possibility of dropping CEA's due to overheated CEDM coils.
- D. 5 hours to prevent the reactor vessel support structure from exceeding its design limits.

Proposed Answer: B

Explanation (Optional):

- A. Time to restore is correct, but overheated CEDM coils is not, although plausible, coils could exceed design temperature if CEDM cooling not restored.
- B. Correct
- C. 5 hours is time to reach hot standby from the time of loss of CEDM cooling fan.
- D. Basis correct, time is not.

Technical Reference(s): 1-AOP-25.01 Loss of RCB Cooling fans. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702602-15 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 41.7 45.6  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	026A1.02	
	Importance Rating	3.6	3.9

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including: Containment temperature

Proposed Question: RO 43

Unit 2 has experienced a large break Loss of Coolant accident with the following conditions:

- Two (2) Containment fan coolers are operating.
- One Containment Spray pump operating with 2500 gpm flow.
- Containment temperature is 245°F.
- Containment pressure is 22 psig.
- Hydrogen Concentration is 0.5%.

Which of the following MINIMUM actions are necessary to meet the Containment Temperature and Pressure control safety function?

- A. Start an additional Containment Spray pump and ensure Spray flow is 2550 gpm or greater.
- B. Increase the flow rate on the running Containment Spray pump to 2550 gpm or greater.
- C. Start one additional Containment Cooler.
- D. Start two additional Containment Coolers.

Proposed Answer: D

Explanation (Optional):

- A. Would be correct if Unit 1 question. Unit 1 requires 2550 gpm flow or greater in addition to two Containment Coolers.
- B. Would be correct if Unit 1 question.
- C. Would be incorrect for both units.
- D. Correct. One CS pump with flow 2700 gpm or greater and two Containment coolers OR Four Containment coolers.

Technical Reference(s): 1-EOP-03, Loss of Coolant Accident. (Attach if not previously provided)

PSL OPS 0711207

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702210-2 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.5  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>039.A4.04</u>	<u>          </u>
	Importance Rating	<u>3.8</u>	<u>3.9</u>

MRSS Ability to manually operate and/or monitor in the control room: Emergency feedwater pump turbines

Proposed Question: RO 44

During start of the 1[2]C Auxiliary Feedwater pump for a surveillance run the following annunciator was received and locked in:

1[2]C AFW Pump Turbine Failure/Trip/ SS Isol G-46
--

The Red and Green lights for MV-08-3, 1[2] C AFW Pump Trip and Throttle valve are both illuminated.

This is an indication of \_\_\_\_\_overspeed on Unit \_\_\_\_\_.

- A. Electrical, Unit 1.
- B. Mechanical, Unit 1.
- C. Electrical, Unit 2.
- D. Mechanical, Unit 2.

Proposed Answer: B

Explanation (Optional):

- A. Because the annunciator 'locked in' this is an indication of mechanical overspeed. If electrical, the annunciator would have cleared.
- B. Correct
- C. If this was a Unit 2 condition, the T&T valve indication would be 'green' only, not red and green. Red and Green position indication is applicable for both electrical and mechanical overspeed conditions on Unit 1 only.
- D. Same explanation as 'C' above.

Technical Reference(s): 1-AOP-09.02, Auxiliary Feedwater (Attach if not previously provided)

1-ARP-01-G46, Annunciator Response Procedure.

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702412-4,6,10,19 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: \_\_\_\_\_  
41.7 / 45.5 to 45.8

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>039A4.07</u>	<u>          </u>
	Importance Rating	<u>2.8</u>	<u>2.9</u>

MRSS Ability to manually operate and/or monitor in the control room: Steam dump valves

Proposed Question: RO 45

Unit 2 is in Mode 3 with the following:

- Steam Bypass Control System (SBCS) controllers are in AUTOMATIC controlling RCS Tave at 532°F.
- A condenser backpressure pressure transmitter (PS-10-9) briefly spiked to 14" Hg absolute then returned to 5.7" Hg absolute.

SBCS valves:

- close until the SBCS PERMISSIVE SWITCH is taken to 'MANUAL'.
- close until the SBCS VACUUM INTERLOCK PUSHBUTTON is depressed.
- close and automatically reopen as backpressure returned to 5.7" Hg absolute.
- remained controlling in Automatic due to the low vacuum setpoint NOT reached.

Proposed Answer: C

Explanation (Optional):

- A. SBCS PERMISSIVE SWITCH is for low steam pressure of 806 psia not low vacuum.
- B. SBCS valves in automatic will return controlling in automatic. If valves were in manual. the vacuum interlock PB would have to be depressed.
- C. Correct
- D. Low vacuum setpoint is 12" Hg absolute not 14".

Technical Reference(s): PSL OPS SYS 406 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702406-12 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # 1329 (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: \_\_\_\_\_  
41.7 / 45.5 to 45.8 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>059K4.19</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>3.4</u>

Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Automatic feedwater isolation of MFW

Proposed Question: RO 46

On Unit 1, which ONE of the following will automatically terminate Main Feedwater to the Steam Generators?

A trip from 100% power and:

- A. Containment pressure rises to 4 psig 5 minutes after the trip.
- B. Steam Generator levels lower to 19% 6 minutes after the trip.
- C. Steam Generator levels rise to 90% 5 minutes after the trip.
- D. A complete loss of Nitrogen supply pressure to the Main Feedwater Isolation valves.

Proposed Answer: C

- A. This would be correct for Unit 2 in that MSIS is 3.5 psig which closes the MFIV's
- B. This is AFAS setpoint for which Unit 1 AFAS does not close the MFIV's thus main feedwater is not terminated. Would be correct for Unit 2.
- C. Correct, 90% level trips the Main Feedwater pumps.
- D. Loss of Nitrogen fails the MFIV's 'AS IS'.

Proposed references to be provided to applicants during examination:

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

Question Cognitive Level: Memory or Fundamental Knowledge      X  
Comprehension or Analysis

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>061.A1.03</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>3.6</u>

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: Interactions when multi unit systems are cross tied

Proposed Question: RO 47

Given the following conditions:

- Unit 2 is at 100% power
- Unit 2 CST level is 36 ft.
- Unit 1 is in Mode 3, NOP / NOT preparing to cooldown to Mode 5
- Unit 1 CST has been damaged by a tornado. The current level is 4 feet.
- Unit 2 CST is currently aligned to the Unit 1 AFW pumps IAW 1-AOP-09.02, 'Auxiliary Feedwater'

Which ONE of the following action(s) must be taken if the suction pressure lowers to 3 psig on the running Unit 1 AFW pump(s)?

- A. Throttle the running AFW pump(s) discharge MOV(s).
- B. Stop all but ONE AFW pump.
- C. Stop ALL running AFW pumps.
- D. Fill the Unit 2 CST to >40 feet.

Proposed Answer: A

Explanation (Optional):

- A. Correct (caution statement on page 26 of 36 of AOP).
- B. Plausible as the supply from Unit 2 CST to Unit 1 AFW pumps is a common suction line.
- C. Plausible, same explanation as B.
- D. Plausible as the AOP requires a different Unit 2 CST lineup for CST levels of >40 and <40 ft. Higher CST level results in higher AFW pump suction pressure.

Technical Reference(s): 1-AOP-09.02, Auxiliary Feedwater (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702860-3 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge      X  
Comprehension or Analysis

10 CFR Part 55 Content:	41.5
	<u>45.5</u>

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>062k3.01</u>	<u>          </u>
	Importance Rating	<u>3.5</u>	<u>3.9</u>

Knowledge of the effect that a loss or malfunction of the ac distribution system will have on the following: AC Electrical Distribution System: Major system loads

Proposed Question: RO 48

Unit 1 is operating at 100% power when the following alarm is received:

4KV SWGR 1A3 Δ CURRENT TRIP B-14
---

Which ONE of the following states the status of the 1A Diesel Generator?

The 1A Diesel Generator:

- A. has started and sequenced loads that were previously running on the 1A3 4.16 KV bus.
- B. has started but does NOT load on the 4.16 KV bus until the Δ Current relay is reset.
- C. does NOT start until the Δ Current relay is reset.
- D. does NOT start until all loads that were previously running are 'Green Flagged' AND the Δ Current relay is reset.

Proposed Answer: B

Explanation (Optional):

- A. Diesel will start but NOT sequence loads
- B. Correct, Diesel starts and as soon as the  $\Delta$  Current relay is reset the Diesel output breaker will close and sequence loads.
- C. Diesel WILL start
- D. Diesel will start, Green flagging previously running equipment is plausible in that other procedures, i.e. Blackout, direct green flagging previously running equipment prior to restoring power.

Technical Reference(s): 1-ARP-01-B14 (Attach if not previously provided)  
1-AOP-47.01A, Loss of Safety  
Related AC Bus – Train A

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702501-14 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 41.7  
45.6

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	063K2.01	
	Importance Rating	2.9	3.1

Knowledge of bus power supplies to the following: Major DC loads

Proposed Question: RO 49

Unit 2 was at 100% power when a loss of the 2A DC bus occurs.

Which ONE of the following indicates the AFW availability?  
(assume AB DC bus aligned to the A side)

- 1) The 2B AFW pump to the:
  - 2) the 2C AFW pump steam from the:
- 
- A. 1) 2A Steam Generator.  
2) 2B Steam Generator and feeding the 2A Steam Generator.
  - B. 1) 2A Steam Generator.  
2) 2A Steam Generator and feeding the 2B Steam Generator.
  - C. 1) 2B Steam Generator.  
2) 2A Steam Generator and feeding the 2A Steam Generator.
  - D. 1) 2B Steam Generator.  
2) 2B Steam Generator and feeding the 2B Steam Generator.

Proposed Answer: C

Explanation (Optional):

Unit 2 DC supply design basis is to be able to feed a faulted SG in conjunction with the opposite side loss of DC power. i.e. if the 2A SG is faulted and a loss of the B DC bus occurs the A DC bus still powers the valves to feed the 2B SG. The 2C AFW trip and throttle valve (MV-08-3 normally open) is AB DC bus powered and the feed supply valves are A powered to feed the B SG and B powered to feed the A SG.

Technical Reference(s): 0711412 AFW / AFAS (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS SYS 313-4 (As available)

Question Source: Bank # QID 670  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.7  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>064A1.03</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>3.3</u>

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: Operating voltages, currents, and temperatures

Proposed Question: RO 50

Unit 2 has experienced a LOOP. Both Emergency Diesel Generators (EDG's) are loaded on their respective busses.

Which ONE of the following can be manually controlled from the EDG controls on the RTGB for this condition?

Emergency Diesel Generator:

- A. Voltage
- B. Frequency
- C. Load
- D. Emergency STOP pushbutton

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Frequency is not adjustable for the given situation.
- C. Load is not adjustable for the given situation.
- D. Emergency stop pushbutton in not operable from the RTGB for the given situation.

Technical Reference(s): PSL OPS 0711501 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702501-13 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.5  
45.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	064A3.01	
	Importance Rating	4.1	4.0

Ability to monitor automatic operation of the ED/G system, including: Automatic start of compressor and ED/G

Proposed Question: RO 51

Unit 1 is at 100% power with the following conditions:

- The 1A Emergency Diesel Generator air dryers have been issued a clearance which included taking the air dryer switch to the OFF position.
- Air pressure on all the air receivers is 175 psig.

An inadvertent Channel 'A' CIAS occurs.

Which ONE of the following states the status of the:

- 1) 1A Emergency Diesel Generator (EDG)
  - 2) 1A Diesel Generator Air Start system?
- A. 1) The 1A EDG is NOT running.  
2) The electric driven air compressor IS running.
  - B. 1) The 1A EDG IS running.  
2) The electric driven air compressor IS running.
  - C. 1) The 1A EDG is NOT running.  
2) The electric driven air compressor is NOT running.
  - D. 1) The 1A EDG IS running.  
2) The electric driven air compressor is NOT running.

Proposed Answer: C

Explanation (Optional):

- A. Diesel does not receive a start signal on CIAS, only SIAS. The air compressors are interlocked with the dryer start switch. If the dryer start switch is in the OFF position the compressor will not start even though the receiver pressure is less than the start pressure. (180 psig is the auto start setpoint of the compressor)
- B. Both are incorrect
- C. Correct
- D. EDG NOT running

Technical Reference(s): PSL OPS 0711501 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702501-4, 9 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.7  
45.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	073G2.4.46	
	Importance Rating	4.2	4.2

Process radiation monitoring: Ability to verify that the alarms are consistent with the plant conditions.

Proposed Question: RO 52

The following conditions exist on Unit 1:

- The 'A' Steam Generator blowdown monitor, Channel 44, is in ALERT.
- A Steam Generator tube leak of about 10 gpm is suspected.
- The crew is performing a rapid downpower and is currently at 95% power

As the downpower reaches 80%, the leak increases to 40 gpm and the Blowdown monitor goes to HIGH alarm.

Which ONE of the following states the expected INDICATION of the Steam Generator Blowdown indication on PT 6, CHNL 44, RR-26-1D, 'Process Monitoring' as Channel 44 goes from the ALERT condition to the HIGH alarm?

PT 6, CHNL 44 Blowdown activity will:

- DECREASE and continue to DECREASE due to the lower power level.
- INCREASE and continue to INCREASE due to the change in leak rate.
- NOT change due to lower power level even though increased leak rate.
- INCREASE, then NOT change due to the monitored sample being in a stagnant fluid.

Proposed Answer: D

- A. If the leak rate remained constant as the downpower progressed Blowdown activity on seen on Channel 44 will DECREASE due to the short lived isotopes ( $N_{16}$ ).
- B. If the Blowdown sample valves did not isolate when Channel 44 went to HIGH alarm this would be correct.
- C. Plausible due to the lowering power level resulting in lower levels of  $N_{16}$  on the downpower.
- D. Correct. Due to the increased leak rate when Channel 44 was in ALERT however when Channel 44 went to HIGH the blowdown sample valves went closed resulting in a stagnant fluid in the sample line.

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Question Source: Bank # \_\_\_\_\_  
Modified Bank # QID 4158 (Note changes or attach parent)  
New

Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>
	Comprehension or Analysis	X

Comments: Changes from bank question:

Change to Unit 1, changed leak rate and power level, mixed distractors, Changed stem to read blowdown goes from ALERT to HIGH instead of just HIGH. Changed responses when going from ALERT to HIGH.



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	076A4.04	
	Importance Rating	3.5	3.5

Service Water System Ability to manually operate and/or monitor in the control room: Emergency heat loads

Proposed Question: RO 53

Unit 1 is at 100% power with the CCW HX, ICW strainers in an automatic backwash cycle.

Unit 1 then tripped due to a large break loss of coolant accident (LOCA).

Shortly after SIAS actuation the below alarm annunciated.

A ICW HDR MV-21-3 OVRD / SIAS FAIL TO CLOSE E-22
--

- 1) What position would HCV-21-7A and HCV-21-7B, Debris Disch. Isol. indicate on RTGB 102?
- 2) What affect could the above alarm have?

- A. 1) Closed.  
2) Reduction of ICW flow / heat removal capability through the CCW heat exchanger.
- B. 1) Closed  
2) ICW header flow exceeding design basis
- C. 1) Open  
2) Reduction of ICW flow / heat removal capability through the CCW heat exchanger.
- D. 1) Open  
2) ICW header flow exceeding design basis

Proposed Answer: A

Explanation (Optional): NOTE: The only 'emergency' heat load on the service water (ICW) system is the CCW heat exchangers.

- A. Correct. HCV-21-7A and HCV-21-7B receive a closed signal on SIAS. These valves have indication on the RTGB. Part two is correct. Annunciator E-22 indicates ICW to the TCW Hx and Blowdown Hx did not close. This results in reduced flow through the CCW Hx's and reduced heat removal capability.
- B. Part two incorrect but plausible in that design ICW flow through the CCW Hx. during accident conditions is maximum 16500 gpm. With the failure of MV-21-3 to close, ICW did not isolate to the TCW and Blowdown Hx. Resulting in high OVERALL ICW header flow but lower than design flow through the CCW Hx.
- C. SIAS wil have closed HCV-21-7A and HCV-21-7B.
- D. SIAS wil have closed HCV-21-7A and HCV-21-7B.

Technical Reference(s): 0711313 (Attach if not previously provided)  
1-ARP-01-E22

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702313-17 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: \_\_\_\_\_  
41.7 / 45.5 to 45.8 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	078A3.01	
	Importance Rating	3.1	3.2

Instrument air system Ability to monitor automatic operation of the IAS, including: air pressure

Proposed Question: RO 54

Unit 1 is at 100% power with the 1C Instrument Air compressor in RUN and the 1D Instrument air compressor is in AUTO.

Which of the following conditions requires a MANUAL RESET and MANUAL START of the standby 1D Instrument Air Compressor?

The 1C Instrument Air Compressor tripped on:

- A. Motor overload.
- B. High temperature.
- C. Low oil pressure.
- D. High pressure.

Proposed Answer: D

Explanation (Optional):

A,B,C are all automatic trips of the running compressor, which will result in lowering of instrument air pressure until the automatic start of the standby compressor. Auto start does not require any manual reset for the given conditions.

D. Correct: If the running compressor trips on a high pressure condition, the standby compressor will not auto start and must be manually reset and manually started.

Technical Reference(s): PSL OPS 0711413 Instrument and Station Air (Attach if not previously provided)

1-AOP-18.01 Instrument Air  
Malfunction Page 15 NOTE

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702413-04 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 41.7  
45.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	103K3.02	
	Importance Rating	3.8	4.2

Containment systems Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under normal operations

Proposed Question: RO 55

Which ONE of the following would result in a VIOLATION of Containment Integrity while the Unit is in Mode 1?

- A. Stroke testing the Containment Vacuum Reliefs.
- B. A Containment Isolation valve stroke time is in the Alert range.
- C. A motor operated Containment Isolation valve will NOT fully close with the motor but is closed manually and is de-energized.
- D. Opening a locked manual Containment Isolation valve in the penetration room and stationing an operator in the Control Room to close this valve in the event of an accident.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect: does not prevent the valves from performing their design function. (Ref. page 25 of 37 Ops Policy, OPS-503)
- B. Incorrect: Alert range does not make the valve inoperable, required action would make the valve inoperable.
- C. Incorrect: manually closing the valve and de-energizing is acceptable to meet containment isolation.
- D. Correct: Operator must be on location at the valve with radio contact to meet isolation criteria.

Technical Reference(s): Tech. Spec. bases 3/4.6 (Attach if not previously provided)  
Tech Spec. 3.6.1.3  
Operations Policy  
OPS-503 Tech Spec Guidance

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0902723-02, 0902723-03 (As available)

Question Source: Bank # QID 4024  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 41.7  
45.6

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>017A1.01</u>	<u>          </u>
	Importance Rating	<u>3.7</u>	<u>3.9</u>

In-Core Temperature Monitor (ITM) System Ability to predict and/or monitor changes in parameters  
(to prevent exceeding design limits) associated with operating the ITM system controls including: Core exit temperature

Proposed Question: RO 56

Unit 2 is experiencing a Large Break Loss of Coolant accident.

Which ONE of the following is the MOST DEFINITIVE system used to determine a possible superheat condition in the core and how can this parameter be monitored from the RTGB?

- A. Heated Junction Thermocouples (HJTC's) by selecting 'RCS' on QSPDS.
- B. Core Exit Thermocouples (CET's) by selecting 'INCORE' on ERDADS.
- C. Heated Junction Thermocouples (HJTC's) by selecting 'INCORE' on ERDADS.
- D. Core Exit Thermocouples (CET's) by selecting 'RCS' on QSPDS.

Proposed Answer: D

Explanation (Optional):

- A. HJTC's show the liquid inventory above the core. Used to indicate the period from initial occurrence of saturation conditions until the start of core uncover.
- B. CET's is correct hover selecting 'INCORE' on the ERDADS display does not indicate the temperature of the core.
- C. Both HJTC's and ERDADS incorrect
- D. Correct, selecting RCS on QSPDS will display numerous information including CET temperatures.

Technical Reference(s): 0711407 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702407-3 (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 41.5  
45.7

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>029A4.04</u>	<u>          </u>
	Importance Rating	<u>3.5</u>	<u>3.6</u>

Containment purge system Ability to manually operate and/or monitor in the control room: Containment evacuation signal

Proposed Question: RO 57

Unit 1 is in Mode 5 with a Containment Purge in progress.

Channel MD CIAS radiation monitor fails high.

Which ONE of the following states the status of the Containment Purge system and Containment evacuation alarm?

Containment Purge:

- A. isolates and the Containment evacuation alarm actuates.
- B. continues to operate and the Containment evacuation alarm actuates.
- C. isolates and the Containment evacuation alarm remains silent.
- D. continues to operate and the Containment evacuation alarm remains silent.

Proposed Answer: B

Explanation (Optional):

Logic to stop Containment purge is 2/4 HIGH HIGH on CIAS monitors. Logic to actuate the Containment evacuation alarm is 1/4 HIGH HIGH.

Technical Reference(s): PSL OPS 0711602 (Attach if not previously provided)  
0711410

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702206-17 (As available)  
PSL OPS 0702410-5

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: \_\_\_\_\_  
41.7 / 45.5 to 45.8 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>033A2.03</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>3.5</u>

Spent Fuel Pool Cooling Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Abnormal spent fuel pool water level or loss of water level

Proposed Question: RO 58

St. Lucie plant has experienced a catastrophic natural event that has resulted in Unit 2 Spent fuel pool structure damage with an estimated leak rate of 400 gpm.

2-AOP-04.01, 'Fuel Pool Cooling System' has been entered.

Which ONE of the following states the significance of the leak rate AND the Fuel Pool makeup source that would be used to compensate for the above leakage? (assume Spent Fuel Pool is accessible)

- A. The above leak rate is WITHIN the 'normal makeup' flow rate. The makeup flowpath will be from the Fuel Pool purification system with suction from the RWT.
- B. The above leak rate is WITHIN the 'normal makeup' flow rate. Primary Water pumps with suction from the Primary Water tank.
- C. The above leak rate is OUTSIDE the 'normal makeup' flow rate. Portable Fire pump with suction from the City Water Storage Tanks.
- D. The above leak rate is OUTSIDE the 'normal makeup' flow rate. Intake Cooling water from the discharge of the Intake Cooling Water header.

Proposed Answer: C

- A. Flow is not adequate. Only rated for 150 gpm.
- B. Flow is not adequate. Only rated for 100 gpm
- C. Correct, flow is capable of >500 gpm
- D. Flow is not adequate. Only capable of 150 gpm.

Technical Reference(s): 2-AOP-04.01, 'Fuel Pool Cooling System' (Attach if not previously provided)

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PSL OPS 0711208

Learning Objective: PSL OPS 0702208-8d, 14a (As available)

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

Question History: Last NRC Exam

Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>
	Comprehension or Analysis	X

10 CFR Part 55 Content: \_\_\_\_\_  
41.5 / 43.5 / 45.3 / 45.13

Page 116 of 150

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>035A3.01</u>	<u>          </u>
	Importance Rating	<u>4.0</u>	<u>3.9</u>

Steam Generator Ability to monitor automatic operation of the S/G including: S/G water level control

Proposed Question: RO 59

Unit 1 is at 90% power, increasing power to 100% at 3MWe / min. The 1A Main Feedwater Regulating valve (HPFRV) stops responding to the power increase and has failed 'as is'.

Assuming NO Operator actions and the power increase progresses, which of the following states the 1A SG level response?

1A SG level will initially:

- A. lower from setpoint until the Low Power FRV opens to return SG level to setpoint.
- B. lower from setpoint and continue to lower resulting in 1A SG level low alarm.
- C. rise from setpoint as the Low Power FRV initially opens to control SG level at setpoint.
- D. remain at setpoint with the Low Power FRV controlling SG level.

Proposed Answer: A

- A. Correct, the low power FW valve stays in AUTO during normal power operation. When the high power FW valve stops responding and the up power continues the SG level will initially lower until the low power FW valve sees a deviation from setpoint and opens to control level.
- B. Plausible if the applicant believes the LPFRV is normally kept in Manual.
- C. Plausible if the applicant believes the LPFRV immediately opens in response to the failure of the MFRV.
- D. A deviation from setpoint must exist to initially open the LPFRV.

Technical Reference(s): 1-AOP-09.01, Feedwater Control System Abnormal Operations. (Attach if not previously provided)

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0711408

Learning Objective: PSL OPS 0702408-13 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>
	Comprehension or Analysis	X

10 CFR Part 55 Content:	<u>41.7</u>
	45.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>045K3.01</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>3.2</u>

Main Turbine Generator Knowledge of the effect that a loss or malfunction of the MT/G system will have on the following:  
Remainder of the plant

Proposed Question: RO 60

Unit 2 is at 12% power and has just synchronized the Main Generator to the grid. The Generator picked up 40 MWe and then tripped 5 seconds later.

Which ONE of the following states the expected plant indication?

- A. Reactor power indicates 12% with SBCS opening to control temperature.
- B. Reactor power indicates 12% with ADV's opening to control temperature.
- C. The 15% FW bypass valves controlling SG levels in automatic.
- D. Trip Circuit Breaker (TCB) lights indicate 'GREEN' with SBCS closing to control temperature.

Proposed Answer: A

Explanation (Optional):

- A. Correct, turbine trip with Reactor power less than 15% does not result in Reactor trip.
- B. ADV's are used for power level between 5-8% not 12%.
- C. The 15% FW bypass valves would go to 5% post trip condition based on EH header pressure. No automatic control until the override pushbutton depressed.
- D. Green TCB indicating lights indicate TCB open. Reactor did not trip because power was less than 15% when turbine tripped. If Reactor did trip SBCS would be closing to control SG pressure.

Technical Reference(s): 2-GOP-201 Reactor Plant Startup – Mode 2 to Mode 1. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 0702822-2 (As available)

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

Question History: Last NRC Exam X See  
comment  
below

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 41.7  
45.6

Comments:

Modified from Question #1 from last NRC RO exam. Original question not yet in exam bank.



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>055K1.06</u>	<u>          </u>
	Importance Rating	<u>2.6</u>	<u>2.6</u>

Knowledge of the physical connections and/or cause effect relationships between the CARS and the following systems: PRM system (process radiation monitoring)

Proposed Question: RO 61

Unit 1 is at 2% power performing a plant startup with the following:

- The Hogging Ejectors have just been placed in service to initially draw a vacuum in the condenser.
- Main Steam Isolation Valves are open with ADV's in service.

If a Steam Generator tube leak developed, which ONE of the following states the secondary radiation monitor(s) that would indicate the Steam Generator tube leakage?

- A. ONLY Main Steam Line monitors and SG Blowdown monitors.
- B. ONLY SG Blowdown monitors.
- C. ONLY SJAE monitor and Main Steam Line monitors.
- D. SJAE, Main Steam Line monitors and SG Blowdown monitors.

Proposed Answer: A

Explanation (Optional):

When HOG's in service, the air ejector radiation monitor is bypassed. Any Steam Generator tube leakage will not be seen by the SJAE radiation monitor as the radiation monitor suction flowpath is from the SJAE aftercondenser, which is not in service with the HOG's operating. (attached marked up drawing)

Technical Reference(s): Drawing 8770-G-079 Sheet 6 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: \_\_\_\_\_ (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: \_\_\_\_\_  
41.2 to 41.9 / 45.7 to 45.8 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>056G2.4.4</u>	<u>          </u>
	Importance Rating	<u>4.5</u>	<u>4.7</u>

Condensate System: Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.

Proposed Question: RO 62

Unit 1 is at 40% power with the following conditions:

- 1A Main Feedwater pump running
- 1A and 1C Condensate pump running

Condensate header recirc. valve, FCV-12-1 opens to a flow of 10,000 gpm.

Which of the following would be the FIRST procedure to enter?

- A. 1-EOP-01, 'Standard Post Trip Actions'
- B. 1-AOP-22.01, 'Rapid Downpower'
- C. 1-AOP-09.04, 'Feedwater, Condensate, and Heater Drain Pump Abnormal Operations'
- D. 1-AOP-12.01, 'Loss of Condenser Vacuum'

Proposed Answer: C

- A. FCV-12-1 opening to 10,000 gpm with two condensate pumps running, one Main feedwater pump running, and 40% power, the perturbation would not result in lowering SG levels requiring a Reactor Trip.
- B. This would be correct only after entering 1-AOP-09.04 and MFW pump suction pressure lowered to <400 psig. Given the stated conditions in the stem, the 400 psig suction pressure would not be met.
- C. Correct
- D. Plausible as this would be correct if low power and FCV-12-1 Failed CLOSED.

Technical Reference(s): 1-AOP-09.04, 'Feedwater, Condensate, and Heater Drain Pump Abnormal Operations' (Attach if not previously provided)

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PSL OPS 0711301

Learning Objective: PSL OPS 0702301-15 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>
	Comprehension or Analysis	X

10 CFR Part 55 Content: \_\_\_\_\_  
41.10 / 43.2 / 45.6

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>068K6.10</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>2.9</u>

Knowledge of the effect of a loss or malfunction on the following will have on the Liquid Radwaste System : Radiation monitors

Proposed Question: RO 63

On Unit 1, Liquid Waste Radiation Monitor R-6627 has been declared out of service.

IAW 1-NOP-06.01, 'Controlled Liquid Release to the Circulating Water Discharge', which ONE of the following states the MINIMUM required actions to perform a controlled liquid release to the Circulating Water Discharge?

- A. An independent verification of the Initial valve alignment AND two independent release rate calculations.
- B. An independent verification of the Initial valve alignment AND Two independent radioactivity analysis of the tank to be released.
- C. Two independent radioactivity analysis of the tank to be released AND two independent release rate calculations.
- D. An independent verification of the Initial valve alignment AND two independent radioactivity analysis of the tank to be released AND two independent release rate calculations.

Proposed Answer: D

Explanation (Optional):

D. Correct, ALL actions are required to be performed with R-6627 out of service.

Technical Reference(s): 1-NOP-06.01, Controlled Liquid Release to the Circulating Water Discharge. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: \_\_\_\_\_ (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 41.7 \_\_\_\_\_  
45.7 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>075K2.03</u>	<u>          </u>
	Importance Rating	<u>2.6</u>	<u>2.7</u>

Knowledge of bus power supplies to the following: Emergency/essential SWS pumps

Proposed Question: RO 64

Unit 2 is at 100% power, steady state.

- An Equipment Clearance order is being executed to remove 2B Intake Cooling Water (ICW) pump from service for a motor inspection.
- It is desired to align 2C ICW pump to replace 2B.

Which ONE of the following describes the MINIMUM electrical alignment that will meet the requirements of the Technical Specifications LCO for the 2C ICW pump?

- A. ONLY the 2AB 4.16 KV bus aligned to the B 4.16 KV side.
- B. ONLY the 2AB 4.16 KV AND 2AB DC bus aligned to the B 4.16 KV and B DC side.
- C. The 2AB 4.16 KV bus aligned to the B 4.16 KV side and the 2AB 480 V bus and the 2AB DC bus aligned to either the B side OR the A side.
- D. The 2AB 4.16 KV bus, 2AB 480 V bus AND the 2AB DC bus aligned to the B side.

Proposed Answer: D

Explanation (Optional):

- A. Must align 480 V AND DC to B side bus to meet T.S. LCO
- B. Must align 480 V AND DC to B side bus to meet T.S. LCO
- C. 480 V and DC MUST be to B side. Cannot be to either or.
- D. Correct

Technical Reference(s): 2-NOP-52.02, Alignment of 2AB Busses and Components. (Attach if not previously provided)  
T.S. 3.7.4 ICW  
\_\_\_\_\_  
Design Basis Document (DBD-ICW-2)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: PSL OPS 0702313-16 (As available)

Question Source: Bank # QID 4189  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 41.7  
\_\_\_\_\_

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>079K4.01</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>3.2</u>

Knowledge of SAS design feature(s) and/or interlock(s) which provide for the following: Cross-connect with IAS

Proposed Question: RO 65

Unit 1 is at 100% power when the following alarm is received:



The crew has implemented 1-AOP-18.01, 'Instrument Air Malfunction'.

The Instrument air pressure indicates 99 psig and slowly lowering. The 1C Instrument air compressor has tripped and the 1D compressor is out of service on a clearance.

Which ONE of the following Operator actions, as directed in 1-AOP-18.01, would be the FIRST step to mitigate the lowering of Instrument air pressure?

- A. Open the Unit to Unit Instrument air cross-ties.
- B. Start the 1A and or 1B Instrument air compressor(s).
- C. Open the Station air to Instrument air crosstie.
- D. Swap air dryers, place the standby air dryer in service.

Proposed Answer: C

- A. The Unit to Unit Instrument air crosstie valves are automatic valves. The Valve from the other unit will open at 85 psig on the affected Unit. Manual control of these valves are not directed by this procedure.
- B. This action is directed in AOP-18.01 however there are numerous manual valves to open prior to starting the compressors.
- C. Correct, this is a one valve lineup that will quickly tie station air to instrument air.
- D. This step is directed in the procedure but after opening the service to instrument air crosstie.

Proposed references to be provided to applicants during examination: \_\_\_\_\_

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

Question Cognitive Level: Memory or Fundamental Knowledge      X  
Comprehension or Analysis

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	1	
	K/A #	G2.1.1	
	Importance Rating	3.8	4.2

Knowledge of conduct of operations requirements.

Proposed Question: RO 66

The plant has been at 100% power for 210 days. You have been on vacation for 10 days. Upon return to work you will be the Licensed RO OATC (Operator At The Controls). ONE other Licensed RO is assigned to your shift.

Three RCO Trainees have been assigned to your shift.

Which ONE of the following states the review of Station Log requirement AND the allowable number of Trainees in the Operator At the Controls Area (OACA)?

- A. Review the Station Logs back to 10 days ago. ONE (1) Trainee in the OACA.
- B. Review the Station Logs back to 3 days ago. ONE (1) Trainee in the OACA
- C. Review the Station Logs back to 10 days ago. TWO (2) Trainees in the OACA.
- D. Review the Station Logs back to 3 days ago. TWO (2) Trainees in the OACA.

Proposed Answer: D

Explanation (Optional):

Conduct Of Operations fleet procedure requires logs to be reviewed back to a maximum of 3 days. Only ONE RCO trainee per licensed RO is allowed within the confines of the OACA for a total of two trainees for the stated question.

Technical Reference(s): OP-AA-100-1000, Conduct of Ops (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 0902711-01.b (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10  
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	1	
	K/A #	G2.1.14	
	Importance Rating	3.1	3.1

Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trip, mode changes, etc..

Proposed Question: RO 67

Which ONE of the following does **NOT** require a plant wide announcement over the paging system as defined in Ops policy OPS-106, 'Communication':

- A. Performing a resin transfer in the RAB.
- B. Latching the turbine prior to performing a Turbine Startup.
- C. Reducing power from 100% to 99.5% for Tave coast down at end of core life.
- D. Performing the Control Element Assembly Full Length periodic surveillance.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Plant Info announcements are to be made when personnel need to be made aware of changing plant conditions (rad levels could change in the RAB).
- B. Incorrect. Plant Info announcements are to be made when major pieces of plant equipment are changing status (latching the turbine causes turbine valves to move)
- C. Correct. Power changes less than 5% does not require a plant wide announcement.
- D. Incorrect. Plant info announcements are to be made when sensitive evolutions are in progress (this evolution is sensitive in nature in that it is load threatening).

Technical Reference(s): Ops Policy 106 Communications (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 0702841-32 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10  
55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>G2.1.26</u>	<u>          </u>
	Importance Rating	<u>3.4</u>	<u>3.6</u>

Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).

Proposed Question: RO 68

Unit 1 is coming out of a refueling outage. Which ONE of the following is the MINIMUM Plant condition (i.e. lowest Mode) that would require implementation of ADM-01.01, 'Confined Space Entry'?

Entering the Containment after the Unit has just:

- A. reached normal operating temperature and pressure.
- B. announced Reactor is critical.
- C. entered Mode 3 from a Mode 4 condition.
- D. entered Mode 4 from a Mode 5 condition.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect, although plausible as confined space is also applicable when the initial containment entry is made after the Reactor is shutdown, typically Mode 3, NOT, NOP. (normal temperature and pressure)
- B. Correct, Reactor being critical is when IAW ADM-01.01, 'Confined Space Entry' is applicable. (ref. step 6.1.5.A of ADM-01.01)
- C. Incorrect, although plausible as confined space is also applicable when the initial containment entry is made after the Reactor is shutdown, typically Mode 3.
- D. Incorrect, Mode 4 is when Containment integrity is required

Technical Reference(s): IAW ADM-01.01, 'Confined Space Entry' (Attach if not previously provided)

Proposed references to be provided to applicants during examination:

Learning Objective: PSL OPS 0904724 Self Study Workbook #1 Objective 2.8 (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10  
55.43

Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	2	
	K/A #	G2.2.4	
	Importance Rating	3.6	3.6

(multi-unit) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility.

Proposed Question: RO 69

The Control Rooms have been evacuated and 1(2)-ONP-100.02, 'Control Room Inaccessibility' is being implemented.

A plant cooldown and depressurization to Shutdown Cooling is being conducted from the Hot Shutdown panel IAW Appendix E.

As the cooldown and depressurization progresses, which ONE of the following states how ECCS pumps are controlled, prior to reaching SIAS setpoint during the depressurization?

- A. On Unit 1, RACK OUT ALL ECCS pumps.
- B. On Unit 2, RACK OUT ALL ECCS pumps.
- C. On Unit 1, BLOCK SIAS by placing the SIAS keyswitch, to 'SIAS BLOCK' for SIAS Channel A and B.
- D. On Unit 2, BLOCK SIAS by placing the SIAS keyswitch, to 'SIAS BLOCK' for SIAS Channel A and B.

Proposed Answer: D

Explanation (Optional):

A/B. On Unit 1 ONLY, ECCS pumps are placed in TRIP position from the local breaker AFTER SIAS actuation has occurred. On both Units, racking out is performed for Containment Spray pumps when RCS pressure is <1750 psia.

Also, on Unit 2, Either the 2A OR 2B HPSI pump is racked out when RCS pressure is <1750 psia. Unit 1 does not perform this step.

C/D. On Unit 2 ONLY, the Hot shutdown panel has a dedicated keyswitch to block SIAS actuation.

Technical Reference(s): ONP-100.02, 'Control Room Inaccessibility' Appendix E (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: PSL OPS 0702864-1.b (As available)

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

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 6,7,10  
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>G2.2.43</u>	<u>          </u>
	Importance Rating	<u>3.0</u>	<u>3.3</u>

Knowledge of the process used to track inoperable alarms

Proposed Question: RO 70

Which ONE of the following is used to administratively control an annunciator that has been out of service for 10 days?

- A. ADM-09.03, 'Administrative Control Of Defeated Annunciators'
- B. ADM-0010432, 'Control Of Plant Work Orders'
- C. ADM-17.18, 'Temporary Modifications'.
- D. OP-AA-101-1000, 'Clearance and Tagging'

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. This procedure is used to control annunciators that will be defeated for a period of 7 days or less.
- B. Incorrect. This procedure provides the requirements and controls for initiating, approving, authorizing and implementing Work Orders (WOs) for work activities on Safety Related (SR), Quality Related (QR) and Power Block structures, systems and components (SSC), equipment described in the SAR, and SSCs located outside the power block that could potentially interact with the licensed facility.
- C. Correct. Used to control defeated annunciators that will be out of service for longer than 7 days.
- D. Incorrect. This is a worker protection procedure used to make equipment SAFE to work on, not used to control defeated annunciators.

Technical Reference(s): ADM-17.18 Temporary Modifications (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 0902722-11 (As available)

Question Source: Bank #  
Modified Bank #  
New X

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10  
55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.3.13	
	Importance Rating	3.4	3.8

Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Proposed Question: RO 71

Unit 1 is at 100% power preparing for unit shutdown for a refueling outage. The 1A Charging pump is running and the RCO is preparing to start the 1B Charging pump IAW 1-NOP-02.02, "Charging and Letdown".

Which ONE of the following is the correct order to start the 1B Charging Pump?

- A. 1) Start the 1B Charging pump.  
2) Contact the SNPO within 15 minutes to ensure the 1B Charging pump is operating properly.  
3) Notify RP the 1B Charging pump is running.
- B. 1) Contact RP at least 15 minutes prior to starting charging pump.  
2) Direct SNPO to perform a local inspection and verify charging pump is ready to be started.  
3) Start the 1B Charging pump.
- C. 1) Contact RP at least 15 minutes prior to starting charging pump.  
2) Start the 1B Charging pump.  
3) Contact the SNPO to ensure the 1B Charging pump is operating properly.
- D. 1) Direct SNPO to perform a local inspection and verify charging pump is ready to be started.  
2) Approximately 15 minutes later, start the 1B Charging pump.  
3) Notify RP the 1B Charging pump is running.

Proposed Answer: B

Explanation (Optional): FROM: 1-NOP-02.02 Precaution and Limits: Placing a second or third Charging pump in service increases letdown flow and could result in dose rates in letdown cubicle to exceed 1000 mr/hr.

- A. Incorrect: If starting the Charging pump in an off normal or emergency situation this sequence is acceptable.
- B. Correct
- C. Incorrect: Normal starting of Charging pump requires SNPO notified prior to start
- D. Incorrect: RP required to be notified prior to start

Technical Reference(s):    1-NOP-02.02 Charging and                      (Attach if not previously provided)  
   Letdown  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective:        0702801-01                      (As available)

Question Source:            Bank #                      QID 4040  
   Modified Bank #                      (Note changes or attach parent)  
   New                                      \_\_\_\_\_

Question History:            Last NRC Exam                      \_\_\_\_\_

Question Cognitive Level:    Memory or Fundamental Knowledge          X    
   Comprehension or Analysis                      \_\_\_\_\_

10 CFR Part 55 Content:        \_\_\_\_\_  
41.12 / 43.4 / 45.9 / 45.10        \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.3.4	
	Importance Rating	3.2	3.7

Knowledge of radiation exposure limits under normal or emergency conditions.

Proposed Question: RO 72

As an FPL employee, tomorrow you are scheduled to perform valve lineups in the RAB. It's December 22 and your TEDE exposure to date is 775 mrem. Assignment 1 is a 65 minute job to be performed in an area that is 200 mrem/hr.

On Jan 2, you are scheduled for Assignment 2, to work in an area that is 115 mrem/hr for four (4) hours, but the new year updated NRC form 4 has not been filled out.

Which assignment or assignments, if any, can you complete without a dose extension and without exceeding the FPL TEDE administrative dose limits IAW HP-2, FPL 'Radiation Protection Manual'?

- A. CAN complete BOTH assignments.
- B. CAN complete assignment 1 ONLY.
- C. CAN complete assignment 2 ONLY.
- D. CANNOT complete ANY assignment.

Proposed Answer: B

Second assignment is 460 mrem which exceeds the limit of 450 mrem due to NRC Form 4 not filled out for the new year.

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Comments:



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.3.7	
	Importance Rating	3.5	3.6

Ability to comply with radiation work permit requirements during normal or | abnormal conditions.

Proposed Question: RO 73

Unit 1 is in Mode 6 performing refueling operations. A UGS lift is scheduled and you have been assigned to move the Refueling Machine in preparation for this lift. It is expected to take 5 minutes to move the Refueling Machine.

The dose rate on the bridge of the refueling machine is 115 mr/hr.

What type of RWP would be expected and what RP coverage would be **REQUIRED**.

- A. A Job specific RWP with continuous RP coverage.
- B. A Job specific RWP with periodic RP coverage.
- C. A general entry RWP for the RCB with continuous RP coverage.
- D. A general entry RWP for the RCB with periodic RP coverage.

Proposed Answer: B

Explanation (Optional):

Because the Refueling machine is in a High Radiation area a job specific RWP is required. Continuous RP coverage is only **REQUIRED** for LOCKED high radiation area and above.

Technical Reference(s): HPP-3, High Radiation Areas (Attach if not previously provided)

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: \_\_\_\_\_ (As available)

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

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 41.12  
45.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.4.14	
	Importance Rating	3.8	4.5

Knowledge of general guidelines for EOP usage.

Proposed Question: RO 74

The Unit has just tripped.

Prior to formal implementation of EOP-01, 'Standard Post Trip Actions', which ONE of the following CAN BE performed by the RO WITHOUT concurrence of the Unit Supervisor?

- A. Starting an additional Charging Pump with Pressurizer level lowering rapidly.
- B. Closing the Diesel output breaker if it didn't close on a LOOP.
- C. Closing the MSR TCV's due to the MSR Block valves not closing.
- D. Closing the MSIV's due to the Turbine not tripping.

Proposed Answer: D

Explanation (Optional):

Maintaining reactivity control post trip can be performed prior to US concurrence but must be communicated to the US after the evolution, as to what was performed and why.

Technical Reference(s):      Operations Dept. Policy:      (Attach if not previously provided)  
   OPS-521, Emergency  
   Operating Procedure  
   Implementation.  
\_\_\_\_\_  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective:      \_\_\_\_\_ (As available)

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

Question History:      Last NRC Exam      \_\_\_\_\_

Question Cognitive Level:      Memory or Fundamental Knowledge        X    
   Comprehension or Analysis      \_\_\_\_\_

10 CFR Part 55 Content:        41.10    
     45.13  

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.4.3	
	Importance Rating	3.7	3.9

Emergency procedures/ Plan: Ability to identify post-accident instrumentation.

Proposed Question: RO 75

Unit 1 Unit Supervisor is directing implementation of 1-EOP-15, 'Functional Recovery'.

Which ONE of the following identifies the instrumentation that is to be used FIRST by the Operators to assess the status of Safety Functions?

- A. ERDADS instrumentation
- B. DCS instrumentation
- C. Instrumentation ALSO designated as Remote Shutdown instrumentation.
- D. Instrumentation identified by White Bezel around the face of the instrument.

Proposed Answer: D

- A. Incorrect: ERDADS can be used but NOTE states to use Reg. Guide 1.97 instruments for confirmation of Safety Functions
- B. Incorrect: DCS is not used for status of safety functions, although some parameters are available that can be used to confirm other indications that are the primary indications.
- C. Incorrect: Remote shutdown instrumentation is Technical Specification instruments, it is not Reg. Guide designated.
- D. Correct

Technical Reference(s): 1-EOP-15 Functional Recovery (Attach if not previously provided)

PSL OPS 0711417  
Accident Monitoring  
Instrumentation

Learning Objective: PSL OPS 0702417-2 (As available)

Question Source: Bank # QID 4043  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New \_\_\_\_\_

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge      X  
Comprehension or Analysis

10 CFR Part 55 Content:	41.6
	<u>45.4</u>

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