2LOT4 NRC Written Exam

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	1	1
K/A #	001 K5.09	
Importance Rating	3.5	3.7

Knowledge of the following operational implications as they apply to the CRDS: Relationships between reactivity due to boron and reactivity due to control rod.

Question: 1

Which ONE of the following describes the reactivity effect of a Control Bank "D" rod insertion from 200 steps to 160 steps at End of Core Life (EOL) as opposed to Beginning of Core Life (BOL)?

The control rod insertion at EOL has a ...

A. higher effect because differential boron worth is less negative.

B. higher effect because there is a lower boron concentration in the core.

C. lower effect because differential boron worth is more negative.

D. lower effect because there is a lower boron concentration in the core.

Proposed Answer: B

Explanation (Optional):

A. Incorrect because differential boron worth becomes more negative as the core ages.

B. Correct. Less competition for neutrons, more flux at EOL, rod worth is proportional to flux squared at the rod tip.

C. Incorrect because rod insertion has a higher effect at EOL.

D. Incorrect because rod insertion has a higher effect at EOL.

2LOT4 NRC Written Exam

Technical Reference(s): Reactor Theory (Attach if not previously provided)
BVPS-2 Curve Book

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	003 K5.02	
	Importance Rating	2.8	3.2

Knowledge of the operational implications of the following concepts as they apply to the RCPs: Effects of RCP coastdown on RCS parameters.

Question: 2

Which ONE of the following is the basis for the underfrequency trip of the RCP's?

A. Ensures grid stability by reducing grid loading demands after the Normal 4KV busses have transferred to the Station System Service Transformers.

B. Ensures that the RCP's are not operated at critical speeds which could result in severe vibrations and catastrophic failure of the RCP or an RCS LOCA.

C. Ensures that the RCP motor windings will not overheat due to the increased I^2R losses at reduced operating frequencies.

D. Ensures that the inertia of the RCP flywheel will aid in maintaining loop flow thus maintaining DNBR within acceptable limits.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Athough a grid disturbance is the most likely cause of an underfrequency trip. After transfer to SSSTs, not a consideration for RCP trip.

B. Incorrect. The underfrequency trip is in an RCP speed range that would not result in any excessive vibration.

C. Incorrect. Higher inductive reactance is only an effect for severely reduced frequency operation.

D. Correct.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-1.1B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-6.3 Objective 2 (As available)

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

Question History: BVPS-2 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Reordered distractors - review comment.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	003 A3.05	
	Importance Rating	2.7	2.6

Ability to monitor automatic operation of the RCPs, including: RCP lube oil and bearing lift pumps.

Question: 3

The following conditions exist for starting a Reactor Coolant Pump:

- Local Lift Oil Pump control switch in 'AUTO'.
- RCP control switch placed in 'START' and released.

Which ONE of the following describes the sequence of events that will take place to start the RCP?

A. Lift Oil Pump starts. After 50 seconds, RCP starts. 2 minutes later the Lift Oil Pump stops.

B. Lift Oil Pump starts. After 2 minutes, RCP starts. 50 seconds later the Lift Oil Pump stops.

C. After 50 seconds the Lift Oil Pump starts. 2 minutes later the RCP starts. 50 seconds later the Lift Oil Pump stops.

D. After 50 seconds the Lift Oil Pump starts. After 50 seconds the RCP starts. 2 minutes later the Lift Oil Pump stops.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. RCP timer and lift oil pump timer are reversed.

B. Correct.

C. Incorrect. No time delay for lift oil pump.

D. Incorrect. No time delay for lift oil pump and timers are reversed for RCP and lift oil pump.

Technical Reference(s): 2OM-6.4.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-6.3-09 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	004 K4.08	
	Importance Rating	2.8	3.2

Knowledge of CVCS design feature(s) and/or interlock(s), which provide for the following: Hydrogen control in RCS.

Question: 4

Which ONE of the following provides for hydrogen control in the VCT while in Mode 1?

A. [2CHS-PCV116A], VCT Pressure Control Valve automatically modulates to maintain VCT hydrogen pressure at a minimum of 18 psig.

B. [2CHS-PCV118], VCT Hydrogen Supply Pressure Regulator is automatically modulated to maintain VCT hydrogen pressure at a maximum of 75 psig.

C. [2CHS*AOV8101], VCT Vent Valve automatically modulates to maintain a constant hydrogen flow through the VCT.

D. [2CHS*AOV8101], VCT Vent Valve is manually modulated to maintain a 10-20 psig overpressure on the VCT.

Proposed Answer: A

Explanation (Optional):

A. Correct. 2CHS-PCV116A maintains an overpressure of Hydrogen on the VCT to control hydrogen concentration.

B. Incorrect. 2CHS-PCV118 is set to automatically control hydrogen supply at a maximum of 50 psig.

C. Incorrect. 2CHS*AOV8101 is manually operated from the control room.

D. Incorrect. 2CHS*AOV8101 is manually operated from the control room during degassing and to reduce VCT pressure. The operator is directed to close the valve when the high pressure alarm clears (~60 psig).

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-7.1.C (Attach if not previously provided)
2OM-7.1.D
2OM-7.2.A

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-7.1 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	013 K6.01	
	Importance Rating	2.7	3.1

Knowledge of the effect of a loss or malfunction on the following will have on the ESFAS: Sensors and detectors.

Question: 5

Containment Pressure Channel II fails and is properly removed from service.

Which ONE of the following identifies the correct ESF actuation logic for the remaining Containment pressure channels?

A. Safety Injection - 1/2; Containment Spray - 1/3

B. Safety Injection - 1/2; Containment Spray - 2/3

C. Safety Injection - 1/3; Containment Spray - 1/3

D. Safety Injection - 1/3; Containment Spray - 2/3

Proposed Answer: B

Explanation (Optional):

A. Incorrect. SI is normally 2/3 and CS is 2/4. Channel II feeds both circuits. When a protection channel is removed from service, bistables are tripped in all cases except for the automatic CS actuation. Thus, auto SI will occur if either of the two remaining bistables trip, but auto CS still needs 2 of the 3 remaining channels to trip.

B. Correct.

C. Incorrect. SI is 1 of 2. CS is 2 of 3.

D. Incorrect. SI is 1 of 2.

2LOT4 NRC Written Exam

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

_____

_____

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

Question Source: Bank # X

Modified Bank # _____ (Note changes or attach parent)

New _____

Question History: Vendor Bank, Previous NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge _____

Comprehension or Analysis Comprehension

10 CFR Part 55 Content: 55.41 _____

55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	015 K3.01	
	Importance Rating	3.9	4.3

Knowledge of the effect that a loss or malfunction of the NIS will have on the following: RPS.

Question: 6

Given the following:

- A plant startup is in progress and all NI channels are observed to be operating normally.
- All power range channels indicate 9% when channel N43 fails HIGH.

Which ONE of the following describes the effect on the Reactor Protection System?

A. Power Range Monitor N43, high flux high setpoint trip results in a reactor trip.

B. Power Range Monitor N43, high flux low setpoint trip results in a reactor trip.

C. The Power Range, high flux high setpoint trip and the Intermediate Range high level trip are enabled; however, no reactor trip will result.

D. The Power Range, high flux low setpoint trip and the Intermediate Range high level trip are disabled; therefore, no reactor trip will result.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Power Range, high flux high setpoint trip is always active; however, the reactor trip logic is 2/4.

B. Incorrect. Power Range, high flux low setpoint trip is active with <2 power range channels above P10 (10% power); however, the reactor trip logic is 2/4.

C. Correct. Power Range, high flux high setpoint trip is always active, and the Intermediate Range high level trip are enabled with <2 power range channels above P10 (10% power).

D. Incorrect. Power Range, high flux low setpoint rip is active with <2 power range channels above P10 (10% power), and the Intermediate Range high level trip are enabled with <2 power range channels above P10 (10% power).

Technical Reference(s): 2OM-1.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1, Objective 15 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	1	1
K/A #	015 K2.01	
Importance Rating	3.3	3.7

Knowledge of bus power supplies to the following: NIS channels, components, and interconnections.

Question: 7

The Unit is at 100% power with all systems in their at-power NSA configuration when 120 VAC Vital Bus II is deenergized.

Which ONE of the following describes an **IMMEDIATE** consequence associated with the loss of 120 VAC Vital Bus II?

A. AUTO and MANUAL rod withdrawal is blocked.

B. RCS low flow reactor trip logic changes from 2/3 in 1/3 loops to 2/3 in 2/3 loops.

C. All Power Range Nuclear Instrumentation 2/4 logic is reduced to 2/3 until the required bistables are tripped.

D. Rods withdraw until the Nuclear/Turbine Mismatch signal decays out of the Rod Control System.

Proposed Answer: A

Explanation (Optional):

A. Correct. High Power Rod Stop logic is ¼, C-2 from N-42.

B. Incorrect. P-8 logic becomes 1/2 in 1/3 loops (above P-8).

C. Incorrect. Bistables trip on loss of power.

D. Incorrect. Rod Control System uses N-44 input as the power signal and rods are all out and stopped by C-11 and C-2 from N-42.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-2.3.C (Attach if not previously provided)
2OM-2.1.C
2OM-2.5.A.4

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1, Objective 16 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	017 A3.01	
	Importance Rating	3.6	3.8

Ability to monitor automatic operation of the ITM system including: Normal, Natural, and interrupted circulation of the RCS.

Question: 8

Which ONE of the following sets of parameters indicates that natural circulation of the RCS exists?

	SG Pressures	Tcolds	Core Exit TC's
A.	1013 psig and rising	558 °F and dropping	587°F and rising
B.	1035 psig and dropping	548 °F and stable	587°F and rising
C.	1013 psig and dropping	548 °F and dropping	577°F and stable
D.	1035 psig and stable	558 °F and stable	577°F and stable

Proposed Answer: C

Explanation (Optional):

A. Incorrect. SG Press and CET's are rising and Tcold above Tsat of SG. (Tsat for 1035 psig = 550F)

B. Incorrect. CETs rising.

C. Correct. All parameters stable or dropping and Tcold at Tsat of SG.

D. Incorrect. Tcold above Tsat of SG. (Tsat for 1035 psig = 550F)

Technical Reference(s): EOP attachment A-1.7 (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History: Vendor Bank, Previous NRC

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: This was a changed K/A. Manually selected the only other K/A in the topic area. Replaced question per NRC request because it did not match K/A.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	026 A3.02	
	Importance Rating	3.9	4.2

Ability to monitor automatic operation of the CSS, including: Verification that cooling water is supplied to the containment spray heat exchanger.

Question: 9

Given the following conditions:

- A LOCA has occurred.
- RCS pressure is 425 psig.
- Containment pressure is 8.5 psig.
- All equipment is operating as designed.
- NO operator action has been taken.

Which ONE of the following describes the position of [2SWS*MOV103A/B], Recirculation Spray Heat Exchanger Service Water Supply Header A/B Isolation Valves and [2SWS*MOV104A/B/C/D], Recirculation Spray HX Cooling Water Supply Valves?

A. 2SWS*MOV103A/B OPEN and 2SWS*MOV104A/B/C/D OPEN.

B. 2SWS*MOV103A/B OPEN and 2SWS*MOV104A/B/C/D CLOSED.

C. 2SWS*MOV103A/B CLOSED and 2SWS*MOV104A/B/C/D OPEN.

D. 2SWS*MOV103A/B CLOSED and 2SWS*MOV104A/B/C/D CLOSED.

Proposed Answer: A

Explanation (Optional):

A. Correct. Valves open on a CIB signal.

B. Incorrect. MOV104 valves will open.

C. Incorrect. MOV103 valves will open.

D. Incorrect. All valves will open.

Technical Reference(s): 2OM-30.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-30.1 Objective 13 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	056 K1.03	
	Importance Rating	2.6	2.6

Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: MFW.

Question: 10

The Unit is operating at 100% power when BOTH of the running condensate pumps trip.

Which ONE of the following describes the expected Main Feed Pump response?

A. [2FWS-P21A] and [2FWS-P21B] both trip immediately.

B. [2FWS-P21A] and [2FWS-P21B] both trip after a 30 second delay.

C. [2FWS-P21A] trips after a 30 second delay; [2FWS-P21B] trips after a 45 second delay.

D. [2FWS-P21B] trips after a 30 second delay; [2FWS-P21A] trips after a 45 second delay.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Low suction pressure should be in for at least 30 seconds.

B. Incorrect. Both feed pumps trip on low suction pressure of 250 psig, but there is a 15 second difference between the pumps.

C. Incorrect. Opposite of actual trip function.

D. Correct. 21B trips in 30 seconds, and 21A trips 15 seconds later, allowing recovery time to prevent a total loss of feed flow.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-24.1.D page 10 of 25 (Attach if not previously provided)
2SQS-24.1 Page 27 of 73

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-24.1 Objective 5 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	059 K4.16	
	Importance Rating	3.1	3.2

Knowledge of MFW design feature(s) and / or interlock(s), which provide for the following: Automatic trips for MFW pumps.

Question: 11

Which ONE of the following will directly result in a trip of the [2FWS-P21A2], Main Feedwater Pump Motor?

A. Train 'B' Feedwater Isolation Signal.

B. [2FWS-P21B], Main Feedwater Pump low discharge pressure.

C. Reactor trip coincident with low Tavg interlock.

D. Any Train 'B' Feedwater Isolation Valve not fully open.

Proposed Answer: A

Explanation (Optional):

A. Correct. Train 'B' FWIS will trip 2FWS-P21A2 MFP motor; when 2FWS-P21A2 automatically trips, 2FWS-P21A1 trips on interlock.

B. Incorrect. 2FWS-P21B low discharge pressure is not a trip signal for 2FWS-P21A2.

C. Incorrect. Not a trip signal.

D. Incorrect. Not a trip signal.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-24.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-24.1 Objective 14 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	071 K5.04	
	Importance Rating	2.5	3.1

Knowledge of the operational implication of the following concepts as they apply to the Waste Gas Disposal System: Relationship of hydrogen/oxygen concentrations to flammability.

Question: 12

Per 2OM-19.4.A, Gaseous Waste Disposal System Startup, which ONE of the following procedural limits prevents a flammable mixture in the Waste Gas System?

A. Oxygen concentration is maintained ≤4% when hydrogen concentration is > 4%.

B. Hydrogen concentration is maintained ≤4% when oxygen concentration is > 4%.

C. Oxygen concentration is maintained < 2%.

D. Hydrogen concentration is maintained < 2%.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. O2 is controlled to < 2%.

B. Incorrect. O2 is controlled to < 2%.

C. Correct.

D. Incorrect. O2 is controlled.

Technical Reference(s): 2OM-19.4.A (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-19.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	013 K4.10	
	Importance Rating	3.3	3.7

Knowledge of ESFAS design feature(s) and/or interlock(s), which provide for the following: Safeguards equipment control reset.

Question: 13

Which ONE of the following describes the minimum required actions for stopping the Quench Spray Pumps following automatic initiation of Quench Spray?

A. Reset Safety Injection Signal and place Quench Spray Pump control switches in 'STOP'.

B. Reset Containment Isolation Phase B and place Quench Spray Pump control switches in 'STOP'.

C. Reset Containment Isolation Phase A and place Quench Spray Pump control switches in 'STOP'.

D. Reset Safety Injection Signal, then reset Containment Isolation Phase A and place Quench Spray Pump control switches in 'STOP'.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Must reset Containment Isolation Phase B. Reset of SI signal is not necessary.

B. Correct.

C. Incorrect. Must reset Containment Isolation Phase B.

D. Incorrect. Must reset Containment Isolation Phase B. Reset of SI signal is not necessary.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-13.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-13.1 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	006 K2.04	
	Importance Rating	3.6	3.8

Knowledge of bus power supplies to the following: ESFAS-operated valves.

Question: 14

Given the following:

- 480VAC MCC*2-E03 is deenergized due to a fault.
- All other equipment is in the at-power NSA configuration when the reactor automatically trips on low Pressurizer pressure.
- Safety Injection has actuated.

Which ONE of the following describes the status of High Head Safety Injection (HHSI) System?

A. Two HHSI Pumps running and injecting to three RCS cold legs.

B. Two HHSI Pumps running and injecting to two RCS cold legs.

C. One HHSI Pumps running and injecting to three RCS cold legs.

D. One HHSI Pumps running and injecting to two RCS cold legs.

Proposed Answer: A

Explanation (Optional):

A. Correct. Both pumps will inject through cold leg valve 2SIS*MOV867B (parallel flowpath to 2SIS*MOV867A).

B. Incorrect. All 3 flowpaths will be in use.

C. Incorrect. Both HHSI pumps have power available and will start.

D. Incorrect. Both HHSI pumps have power available and will start and inject to 3 RCS cold legs.

Technical Reference(s): 2OM-11.1.D (Attach if not previously provided)
2OM-11.3.C
2OM-1.2.B
2OM-11.2.B

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-11.1 Objective 7 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	2	2
K/A #	039 K3.05	
Importance Rating	3.6	3.7

Knowledge of the effect that a loss or malfunction of the Main and Reheat Steam System will have on the following: RCS.

Question: 15

Given the following conditions:

- A Unit startup is in progress following a mid-cycle outage.
- The reactor is critical at $1E^{-8}$ amps.

A condenser steam dump valve fails partially open.

Assuming **NO** action by the crew, which ONE of the following describes the **IMMEDIATE** effect on the plant?

A. Power INCREASES; RCS Temperature INCREASES

B. Power INCREASES; RCS Temperature DECREASES

C. Power DECREASES; RCS Temperature INCREASES

D. Power DECREASES; RCS Temperature DECREASES

Proposed Answer: B

Explanation (Optional):

A. Incorrect. More steam demand will cause temperature to decrease.

B. Correct. Negative MTC. (Middle of Life) If temperature decreases, power increases.

C. Incorrect. Power increases due to negative MTC. Temperature decreases due to increased heat removal.

D. Incorrect. If MTC was positive, this would be the initial effect, but MTC is only positive at BOL with a high boron concentration.

Technical Reference(s): GFE - Reactor Operational Physics (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-21.1 Objective 11 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	2	2
K/A #	012 K2.01	
Importance Rating	3.3	3.7

Knowledge of bus power supplies to the following: RPS channels, components, and interconnections.

Question: 16

Given the following:

- The Unit is operating at 100% power with all systems in NSA.
- 120VAC Vital Bus 2-1 is deenergized.

Which ONE of the following are confirming indications of a loss of power from 120VAC Vital Bus 2-1?

A. RPS bistable Channel I lamps are ON. NI Rack Channel 1 instrumentation is energized.

B. RPS bistable Channel I lamps are OFF. NI Rack Channel 1 instrumentation is energized.

C. RPS bistable Channel I lamps are ON. NI Rack Channel 1 instrumentation is deenergized.

D. RPS bistable Channel I lamps are OFF. NI Rack Channel 1 instrumentation is deenergized.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. NI Rack Channel 1 is de-energized.

B. Incorrect. RPS bistable Channel 1 lamps are ON.

C. Correct.

D. Incorrect. RPS bistable Channel 1 lamps are ON.

Technical Reference(s): 2OM-53C.4.2.38.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 8 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	033 A3.01	
	Importance Rating	2.5	2.7

Ability to monitor automatic operation of the Spent Fuel Pool Cooling System including: Temperature control valves.

Question: 17

Which ONE of the following describes how Spent Fuel Pool temperature is controlled?

A. [2CCP*MOV128A(B)], Fuel Pool Hx 2FNC*E21A(B) Supply Isolation Vlv automatically maintains temperature.

B. [2CCP*104 (105)], Fuel Pool Cooler 2FNC*E21A(B) Cooling Water Discharge Throttle Vlv is manually throttled to maintain temperature.

C. [2FNC-110 (111)] Heat Exchanger 2FNC*E21A(B) Inlet Isol Vlv is manually throttled to adjust flow through the heat exchanger.

D. [2FNC-113 (114)] Heat Exchanger 2FNC*E21A(B) Outlet Isol Vlv is manually throttled to adjust flow through the heat exchanger.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. No automatic control.

B. Correct.

C. Incorrect. Valve is not adjusted.

D. Incorrect. Valve is not adjusted for temperature control.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-20.4.AAA (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-20.1 Objective 1 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

55.43

Comments: Valve nomenclature added - review comment.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	035 K6.01	
	Importance Rating	3.2	3.6

Knowledge of the effect of a loss or malfunction on the following will have on the S/GS: MSIVs.

Question: 18

Given the following conditions:

- The Unit is at 28% power with all systems in NSA.
- The turbine is synchronized to the grid.
- "21A" Main Steam Isolation Valve closed on a spurious signal.

Assuming the reactor does **NOT** trip, which ONE of the following correctly describes the **INITIAL** response of RCS ΔT and SG pressure in the affected loop?

A. Loop ΔT rises and SG steam pressure rises.

B. Loop ΔT rises and SG steam pressure lowers.

C. Loop ΔT lowers and SG steam pressure rises.

D. Loop ΔT lowers and SG steam pressure lowers.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Loop ΔT goes to near zero.

B. Incorrect. Both parameters are opposite.

C. Correct. In the affected loop, RCS ΔT lowers to zero and SG steam pressure rises because heat removal is minimal.

D. Incorrect. Steam pressure will rise.

Technical Reference(s): Mitigating Core Damage (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-21.1, Objective 11 (As available)

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

Question History: Vendor Bank; Previous NRC

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	039 K1.05	
	Importance Rating	2.5	2.6

Knowledge of the physical connections and/or cause-effect relationships between the MRSS and the following systems: T/G.

Question: 19

Which ONE of the following describes the steam flowpath for the Main Turbine?

A. HP Turbine, MSR's, Reheat Stop and Intercept Valves, LP Turbine.

B. HP Turbine, Reheat Stop and Intercept Valves, MSR's, LP Turbine.

C. MSR's, HP Turbine, Reheat Stop and Intercept Valves, LP Turbine.

D. MSR's, Reheat Stop and Intercept Valves, HP Turbine, LP Turbine.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Sequence not correct.

C. Incorrect. Sequence not correct.

D. Incorrect. Sequence not correct.

Technical Reference(s): 2OM-26.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

2LOT4 NRC Written Exam

Learning Objective: 2SQS-26.1 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	055 A3.03	
	Importance Rating	2.5	2.7

Ability to monitor automatic operation of the CARS, including: Automatic diversion of CARS exhaust.

Question: 20

Given the following conditions:

- The Unit is at 85% power. All control systems are in NSA.
- [A4-5C], Radiation Monitoring Level High is alarming in the Control Room.
- The crew determines that there is a high radiation level on [2ARC-RQI100], Air Ejector Discharge Monitor.

Which ONE of the following describes the subsequent alignment of the Unit 2 Condenser Air Ejector Off-Gas during this event?

A. Manually aligned to the charcoal delay beds

B. Automatically aligned to the charcoal delay beds

C. Manually aligned to the Unit 2 containment

D. Automatically aligned to the Unit 2 containment

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. No automatic function provided for air ejector off-gas high radiation.

C. Incorrect. System aligned to charcoal delay beds on high radiation.

D. Incorrect. No automatic alignment; wrong flowpath.

Technical Reference(s): 2OM-19.4.H (Attach if not previously provided)
2OM-43.4.ACN

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-43.1 Objective 9 (As available)

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

Question History: Previous BVPS-2 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	2	2
K/A #	062 K4.10	
Importance Rating	3.1	3.5

Knowledge of AC Distribution System design feature(s) and/or interlock(s), which provide for the following: Uninterruptable AC power sources.

Question: 21

Given the following:

- The Unit is at 38% power. All systems are in NSA.
- The AC input breaker to 120VAC Vital Bus Inverter 2-3 has tripped OPEN.

Which ONE of the following describes the status of the loads supplied by Vital Instrument Bus 2-3?

A. Deenergized until the Manual Bypass Switch is placed in 'BYPASS'.

B. Energized by MCC*2-E05 via the static switch.

C. Energized by MCC*2-E07 via the static switch.

D. Energized by DC Switchboard 2-3 from the battery.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. The supply from the battery and from MCC*2-E07 is available prior to manual transfer.

B. Incorrect. MCC*2-E05 would be the normal rectified supply that tripped.

C. Incorrect. No need for static switch transfer if battery power remains available.

D. Correct.

Technical Reference(s): 2OM-39.5 Figure 2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	063 K4.02	
	Importance Rating		

Knowledge of DC Electrical System design feature(s) and/or interlock(s) which provide for the following: Breaker interlocks, permissives, bypasses and cross-ties.

Question: 22

125VDC Distribution Panel Sections "A" and "B" on switchboards 2-5 and 2-6 are each equipped with five pairs of mechanically interlocked breakers.

Which ONE of the following describes the operation of these breaker interlocks?

A. Prevents the DC distribution panel from being manually connected to two battery chargers simultaneously resulting in failure of the chargers.

B. Ensures that the normal power supply to components is off prior to manually transferring power to the alternate supply in the case of a shutdown from outside the control room.

C. One breaker of an interlocked pair will close simultaneously with the opening of the other breaker, maintaining power to its DC load.

D. One breaker of an interlocked pair will open simultaneously with the closing of the other breaker, maintaining train separation.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. One breaker of an interlocked pair will open simultaneously with the closing of the other breaker.
B. Incorrect. Interlock not intended to cross-connect the switchboards.
C. Incorrect. One breaker of an interlocked pair will open simultaneously with the closing of the other breaker.
D. Correct.

Technical Reference(s): 2OM-39.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

2LOT4 NRC Written Exam

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	064 K3.02	
	Importance Rating	4.2	4.4

Knowledge of the effect that a loss or malfunction of the ED/G System will have on the following: ESFAS controlled or actuated systems.

Question: 23

The Unit is operating at 80% power, with all systems in NSA, when a LOCA results in a reactor trip and safety injection.

[2CHS*P21C] "C" HHSI/Charging Pump is on clearance.

Following the reactor trip, [ACB-2E7], 4KV EMER BUS 2AE TO 4KV BUS 2A trips, and the 2-1 EDG fails to start.

Which ONE of the following describes the expected status of the High Head SI Pumps?

[2CHS*P21A], HHSI Pump is _____; [2CHS*P21B], HHSI Pump is _____.

A. running; running

B. not running; running

C. running; not running

D. not running; not running

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Bus 2AE deenergized, 'A' HHSI is tripped.

B. Correct. 4160 Volt Emergency Bus 2AE powers the "A" Charging Pump. The "B" charging pump is powered by bus 2DF. When bus 2AE is deenergized, the "A" charging pump will trip. The "B" charging pump will automatically start on the safety injection signal.

C. Incorrect. Bus 2AE deenergized, 'A' HHSI is tripped.

D. Incorrect. 'B' HHSI running from SI signal.

Technical Reference(s): 2OM-36.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-36.2 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	079 A4.01	
	Importance Rating	2.7	2.7

Ability to manually operate and/or monitor in the Control Room: Cross-tie valves with IAS.

Question: 24

Given the following:

- The Unit is operating at 100% power with all systems in NSA.
- There is a leak in the Instrument Air System.
- Station instrument air receiver pressure is 68 psig and slowly LOWERING.
- Station service air receiver pressure is 72 psig and slowly LOWERING.

Which ONE of the following describes the operation of the Service and Instrument Air Systems?

[2SAS-AOV105], SAS Main Header To Service Air Header AOV will...

A. open, connecting service air to instrument air. Two air compressors will run and load.

B. close, isolating service air from instrument air. Three air compressors will run, but only two compressors will supply the instrument air header.

C. open, connecting service air to instrument air. Two air compressors will run, but only one compressor will load.

D. close, isolating service air from instrument air. Three air compressors will run, but only one compressor will supply the instrument air header.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. A low pressure signal will close 2SAS-AOV105 isolating service air to instrument air.

B. Correct.

C. Incorrect. A low pressure signal will close 2SAS-AOV105 isolating service air to instrument air. Thee two service air compressors and condensate polishing air compressor will run and load at 100, 89, and 95 psig respectively. But the CP compressor is isolated from IA by AOV105.

D. Incorrect. All three air compressors will run and see above.

Technical Reference(s): 2OM-34.1.C (Attach if not previously provided)
2OM-34.1.D
2OM-34.1.B

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-34.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Added effect of condensate polishing air compressor - review comment.

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	3	3
K/A #	007 A1.02	
Importance Rating	2.7	2.9

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining quench tank pressure.

Question: 25

Given the following:

- The Unit is at 100% power when a Pressurizer PORV inadvertently opens.
- The reactor was tripped and the PORV is now isolated.
- PRZR Relief Tank (PRT) pressure, temperature and level are now elevated above normal values.

In accordance with 2OM-6.4.AAY, Pressurizer Relief Tank Trouble, PRT parameters are to be restored to normal values by establishing appropriate PRT...

A. level, then temperature, then pressure.

B. pressure, then temperature, then level.

C. level, then pressure, then temperature.

D. pressure, then level, then temperature.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Pressure must be established last because temperature and level both affect pressure.

C. Incorrect. See above.

D. Incorrect. See above.

Technical Reference(s): 2OM-6.4.AAY (Attach if not previously provided)
2OM-6.2.A
2OM-6.1.C

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-6.4 Objective 21 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments: Changes per reviewer comments.

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	3	3
K/A #	045 K4.43	
Importance Rating	2.8	3.2

Knowledge of MT/G system design feature(s) and/or inter-lock(s) which provide for the following: T-ave. program, in relation to SDS controller.

Question: 26

Given the following conditions:

- A 35% load rejection from 100% power has occurred.
- Reactor power is 65%.
- Condenser Steam Dump demand is 55%.

Assuming the reactor is not tripped, how many banks of condenser steam dump valves will be open or partially open?

A. 1

B. 2

C. 3

D. 4

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Too much mismatch.

B. Correct. After a 2 degree deadband, each bank starts opening at approximately 6.5°F intervals until 100% of capacity is reached at a 28°F mismatch. At approximately 8.5°F mismatch 2 banks will be open.

C. Incorrect. Not enough mismatch. Load rejection is less than 50%.

D. Incorrect. Not enough mismatch. Load rejection is less than 50%.

Technical Reference(s): 2OM-21.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-21.1 Objective 8 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Added reactor trip statement per reviewer comments.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	2
	K/A #	027 A4.01	
	Importance Rating	3.3	3.3

Ability to manually operate and/or monitor in the Control Room: CIRS controls.

Question: 27

Which ONE of the following correctly describes the operation of [2HVR-FN203A and 203B], Containment Iodine Filtration Fans?

A. May be started manually only, there are no automatic start signals.

B. May be started manually; automatically starts on only high containment radiation.

C. May be started manually; automatically starts on only any safety injection signal.

D. Automatically starts on either high containment radiation or any safety injection signal.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. No automatic starts.

C. Incorrect. Not operated automatically.

D. Incorrect. Not operated automatically.

Technical Reference(s): 2OM-44C.1.D (Attach if not previously provided)
2OM-53C.4.2.49.1

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-44C.1 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	3	2
K/A #	028 K5.03	
Importance Rating	2.9	3.6

Knowledge of the operational implication of the following concepts as they apply to the Hydrogen Recombiner and Purge control system: Sources of hydrogen within containment.

Question: 28

Given the following conditions:

- A LOCA has occurred.
- The crew was required to perform the actions of FR-C.1, Response To Inadequate Core Cooling.

Which ONE of the following will be the major source of hydrogen buildup in containment for the first 12 hours following this event?

A. Radiolysis of water

B. Zirc-Water reaction

C. Aluminum corrosion reaction

D. RCS hydrogen from the CVCS and the VCT

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Greatest long term contributor.

B. Correct. Inadequate core cooling can result in Zirc-Water reaction that will be the largest contributor to hydrogen concentration immediately following a LOCA.

C. Incorrect. Causes long term H2 buildup.

D. Incorrect. Negligible amount of H2 compared to other sources.

2LOT4 NRC Written Exam

Technical Reference(s): Mitigating Core Damage (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History: Vendor Bank, Previous NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	005 G2.1.32	
	Importance Rating	3.4	

Conduct of Operations: Ability to explain and apply all system limits and precautions.

Question: RO 29

When placing RHS in service, which ONE of the following describes the correct method for avoiding thermal shock to RCS components?

Set the RHS heat exchanger...

A. bypass valve [2RHS*FCV605A/B] to 50%. Slowly open the heat exchanger flow control valve [2RHS*HCV758A/B] to achieve the desired flow rate of 4000 gpm.

B. bypass valve [2RHS*FCV605A/B] to the desired flow setpoint and slowly adjust the heat exchanger flow control valve [2RHS*HCV758A/B] to achieve the desired cooldown rate.

C. flow control valve [2RHS*HCV758A/B] to 35%. Set the heat exchanger bypass valve [2RHS*FCV605A/B] to the desired flow setpoint. Slowly initiate CCP flow to the RHS heat exchanger to achieve the desired cooldown rate.

D. flow control valve [2RHS*HCV758A/B] to 35% and slowly adjust the heat exchanger bypass valve [2RHS*FCV605A/B] to achieve the desired cooldown rate.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. 4000 gpm is the maximum. Bypass valve is not placed at 50% and flow rate is not determined by the flow control valve.

B. Correct.

C. Incorrect. CCP is in service prior to placing RHS in service.

D. Incorrect. Flow controller is set at 35% when filling the system prior to startup.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-10.2.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	034 A2.01	
	Importance Rating		4.4

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

Question: SRO 29

Given the following conditions:

- The Unit is in Mode 6.
- Refueling operations are in progress.
- The CNMT Equipment Hatch is closed.
- The Refueling SRO reports that a fuel assembly has been dropped inside CNMT.
- [2HVR*RQ104A and B], Containment Purge Exhaust Monitors are in High alarm.
- No other radiation monitors are in alarm.

For these conditions, which ONE of the following actions will be required by AOP-2.49.1, Irradiated Fuel Damage While Refueling?

A. Initiate a site evacuation.

B. Manually initiate Control Room isolation.

C. Reset CREBAPS and manually align Control Room ventilation.

D. Ensure CNMT purge dampers are closed and verify that the personnel air lock is shut.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. AOP-2.49.1 ensures the containment is evacuated. EPP's evaluate need for site evacuation.

B. Incorrect. CR radiation monitors not in alarm.

C. Incorrect. CR radiation monitors not in alarm. This action is performed 1 hour after CREBAPS actuates.

D. Correct.

Technical Reference(s): 2OM-53C.4.2.49.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-53C.1 Objective 5 (As available)

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

Question History: BVPS-1 NRC

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) items 4,5,7 because the SRO must determine the event in progress and choose the appropriate procedure action. Additionally, this action is related to minimizing exposure to radiation during accident conditions in the course of fuel movement.

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	2
Group #	3	3
K/A #	041 A1.01	
Importance Rating	2.9	2.9

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SDS controls including: T-ave, verification above low/low setpoint.

Question: 30

The Unit was operating at 100% power when a reactor trip occurred due to a LOCA. All Safety Injection Systems failed to operate and FR-C.1, Response To Inadequate Core Cooling has been entered.

Given the following:

- The Unit Supervisor has directed the depressurization of all intact steam generators to 200 psig using the condenser steam dump valves.
- All main steam trip valves are open and the condenser is available.
- [2MSS*PK464], Steam Dump Controller is in 'MANUAL'.
- The Steam Dump Control Mode Selector Switch is in the 'STM PRESS' position, and steam generator depressurization is underway.
- PRZR pressure is < 1950 psig and the Block Steamline SI Switches have been placed in the 'BLOCK' position.
- As the steam generator depressurization progresses, the steam dump valves automatically shut.

Which ONE of the following has caused the steam dump valves to automatically shut?

A. Steam generator pressure has reached 500 psig.

B. Steam header pressure has dropped below the setpoint on 2MSS*PK464.

C. T_{avg} is below 541°F and no action has been taken to defeat the Tavg Interlock.

D. Containment isolation due to exceeding 1.5 psig pressure setpoint in containment.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Block Steamline SI Switches have been placed in the Block position. The Main Steamline Isolation due to low steam line pressure rate is inactive.

B. Incorrect. 2MSS*PK464 is in manual. Pressure setpoint has no effect.

C. Correct. As Tavg approaches 541°F, the Tavg Interlock must be defeated by holding both steam dump control bypass interlock selector switches to the DEFEAT TAVG NTLK position until the status light, "2/3 Lo-Lo Tavg" is LIT. This action was not performed.

D. Incorrect. Containment pressure setpoint has no effect on steam dump operation.

Technical Reference(s): 2OM-53.A.1.FR-C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-21.1, Objective 11 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Changed per reviewer comment.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A #	076 A3.02	
	Importance Rating	3.7	3.7

Ability to monitor automatic operation of the SWS, including: Emergency Heat Loads.

Question: 31

With the Unit operating at 80% power with all systems in NSA, a LOCA results in a reactor trip and safety injection.

Immediately following the safety injection, [2SWS*P21A], Service Water Pump trips.

Assuming NO operator action and that all systems operate as designed, which ONE of the following describes the impact on the ECCS?

Service water is available to the...

A. [2SIS*P21B], LHSI Pump only.

B. [2CHS*P21B], HHSI Pump only.

C. [2SIS*P21A], LHSI Pump and [2SIS*P21B], LHSI Pump.

D. [2CHS*P21A], HHSI Pump and [2CHS*P21B], HHSI Pump.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Service Water does not cool LHSI Pumps.

B. Incorrect. SWE pump auto starts to restore header pressure.

C. Incorrect. Service Water does not cool LHSI Pumps.

D. Correct.

Technical Reference(s): 2OM-30.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-30.1 Objective 16 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	2
	K/A #	103 K1.01	
	Importance Rating	3.6	3.9

Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: CCS.

Question: 32

Which ONE of the following signals will automatically close [2SWS*MOV152-1], CNMT Air Recirc Cooling Coils Inside CNMT Service Water Inlet Valve?

A. SI

B. CIA

C. CIB

D. MSLI

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Cooling remains aligned.

B. Incorrect. Cooling remains aligned.

C. Correct.

D. Incorrect. MSLI is a different signal than the High-3 that generates CIB.

Technical Reference(s): 2OM-20.1B (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-29.1 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	3	3
Group #	1	1
K/A #	G2.1.31	
Importance Rating	3.0	3.9

Conduct of Operations: Ability to locate Control Room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.

Question: 33

The Unit is in refueling.

Source Range Channel N31 fails low resulting in loss of the AUDIO COUNT RATE signal.

Which ONE of the following actions is the **MINIMUM REQUIRED** to transfer the audio count rate signal to Source Range Channel N32?

A. Place the AUDIO COUNT RATE Selector Switch on the Comparator and Rate drawer to the 'N32' position.

B. Place the LEVEL TRIP BYPASS Switch for N31 to 'BYPASS'. Channel N32 is then automatically selected when the Scaler-Timer is reset.

C. Reset the Scaler-Timer. Ensure the LEVEL TRIP BYPASS Switch for channel N32 is in 'NORMAL' and place the AMPLIFIER SELECT Switch on the AUDIO COUNT RATE drawer to the 'A2' position.

D. Place the LEVEL TRIP BYPASS Switch for N31 to 'BYPASS'. Place the AMPLIFIER SELECT Switch on the AUDIO COUNT RATE drawer to the 'A2' position.

Proposed Answer: A

Explanation (Optional):

A. Correct. Only action required.

B. Incorrect. Audio rate does not require channel bypass and scaler not required for reset. No auto swap.

C. Incorrect. Amplifier select will not matter. Only for where counts will be heard. In A1 or A2 the counts will only be heard in CNMT.

D. Incorrect. Amp select does not matter.

Technical Reference(s): 2OM-2.4E (Attach if not previously provided)
2OM-2.1C

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1 Objective 7 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	1	1
	K/A #	G2.1.17	
	Importance Rating	3.5	3.6

Conduct of Operations: Ability to make accurate, clear and concise verbal reports.

Question: 34

Which one of the following describes the control room communications required in accordance with FENOC Operations Department expectations?

A. All Operations Department communications require three – way communications except when directing manipulation of a control or component in the EOP's, which when suspended by the Unit Supervisor, only requires one – way communication.

B. Operations Department communications at times, may be one – way, such as a Crew Update. Directing manipulation of a control or component however, always requires three – way communication.

C. Operations Department communications must be three – way at all times. Communication with other work groups may be two – way as long as sender and receiver understand the message delivered.

D. All Operations Department communications must be three – way at all times. Communication with other work groups must also be three – way at all times.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Manipulations always require 3-way.

B. Correct. Crew updates are one-way.

C. Incorrect. Crew updates are one-way.

D. Incorrect. Crew updates are one-way

Technical Reference(s): 1/2OM-48.1.D (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	1	1
	K/A #	G2.1.19	
	Importance Rating	3.0	3.0

Conduct of Operations: Ability to use plant computer to obtain and evaluate parametric information on system or component status.

Question: 35

Given the following:

- A reactor trip has occurred from 100% power.
- Actions of E-0, Reactor Trip Or Safety Injection are being performed.
- The crew is checking if SI flow should be terminated when it is determined that RCS subcooling on the PSMS is less than the required 41°F.

Which ONE of the following describes the method used to determine whether RCS subcooling is adequate?

A. Minimum required subcooling is determined using the SPDS; actual RCS subcooling is calculated by the plant computer.

B. Actual RCS subcooling is determined using PRZR pressure and T-hot; minimum required subcooling is determined by the SPDS.

C. Minimum required subcooling is determined using an EOP Attachment; RCS subcooling is determined using PRZR pressure and T-hot.

D. RCS subcooling is determined using the PSMS; minimum required subcooling is determined using an EOP attachment.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Minimum required subcooling is determined using EOP attachment A-5.1, 0°F Plus Subcooling Based On Core Exit TCs.

B. Incorrect. RCS subcooling can be read on the IPC. Minimum required subcooling is determined using EOP attachment A-5.1, 0°F Plus Subcooling Based On Core Exit TCs.

C. Incorrect. Minimum required subcooling is determined using EOP attachment A-5.1, 0°F Plus Subcooling Based On Core Exit TCs.

D. Correct.

Technical Reference(s): 2OM-53A.1-E-0 (Attach if not previously provided)
2OM-53A.1.A-5.1

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-6.7 Objectives 1 and 2 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	3	3
Group #	1	1
K/A #	G2.1.27	
Importance Rating	3.0	2.9

Conduct of Operations: Knowledge of system purpose and or function.

Question: 36

Which ONE of the following describes how the Rod Position Indication System performs its function?

A. Step counters indicate actual rod position. DRPI is an estimate of rod position generated from the Plant Computer System.

B. DRPI indicates actual rod position as determined by a coil stack on the CRDM housing. Step counters indicate demanded rod position from the Rod Control System.

C. Step counters indicate actual rod position as determined by a coil stack on the CRDM housing. DRPI indicates demanded rod position from the Rod Control System.

D. DRPI is an estimate of rod position generated from the Plant Computer System. Step counters indicate demanded position from the Rod Control System.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The IPC only displays data from Rod Position, does not generate position signals.

B. Correct.

C. Incorrect. Opposite of actual function.

D. Incorrect. DRPI displayed, not generated from, IPC.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-1.1B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Changed "IPC" to "Plant Computer System" per reviewer comments.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #	2	2
	K/A #	G2.2.1	
	Importance Rating	3.7	3.6

Equipment Control: Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

Question: 37

Given the following conditions:

- A reactor startup is in progress.
- Estimated Critical Position is Control Bank "D" at 100 steps.
- The ± 500 pcm positions from the ECP are 35 steps and 185 steps on Control Bank "D".
- Control Bank "B" withdrawal is in progress.
- The last two 1/M plots indicate that criticality will be achieved on Control Bank "C" at approximately 100 steps.

Per 2OM-50.4.D, Reactor Startup From Mode 3 To Mode 2, which ONE of the following actions is required for these conditions?

A. Maintain control rods at their current rod height and direct chemistry to sample the RCS for Boron concentration.

B. Stop the startup and verify that the source range NI pulse height discrimination voltage is set correctly.

C. Insert all control banks to zero steps, verify shutdown margin and recalculate the ECP.

D. Continue the startup to obtain one additional 1/M data point to validate the accuracy of the plot.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Required if critical below the RIL.

B. Incorrect. Criticality apparent below the RIL.

C. Correct.

D. Incorrect. Would not proceed with CB withdrawal 2 consecutive plots show criticality below the RIL.

Technical Reference(s): 2OM-50.4.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	3	3
Group #	3	3
K/A #	G2.3.4	
Importance Rating	2.5	2.9

Radiation Control: Knowledge of radiation exposure limits and containment control, including permissible levels in excess of those authorized.

Question: 38

For an employee, which ONE of the following describes when and how the BVPS administrative annual limit for occupational radiation exposure is extended?

Before the employee's BVPS TEDE exceeds a maximum of...

A. 500 mR, additional non-emergency exposure must be approved by the Plant General Manager.

B. 2000 mR, additional non-emergency exposure must be approved by the Plant General Manager.

C. 4000 mR, additional non-emergency exposure must be approved by the Plant General Manager.

D. 5000 mR, a planned special exposure must be authorized by the Plant General Manager.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. 500 mR is the limit for an individual whose prior occupational dose has not been determined.

B. Incorrect. 2000 mR is ALARA guide value for dose received at the station.

C. Correct.

D. Incorrect. The limit is 4000 mR. Also, it is not anticipated that a Planned Special Exposures will be permitted to support normal plant operations and maintenance.

Technical Reference(s): 1/2-ADM-1601, page 13 (Attach if not previously provided)
1/2-ADM-1631, page 8
1/2-HPP-3.05.001, page 6

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	014 A4.01	
	Importance Rating	3.3	3.1

Ability to manually operate and/or monitor in the Control Room: Rod selection control.

Question: 39

Which ONE of the following modes on the Rod Control System Mode Selector Switch will provide the **FASTEST** rod speed if rod motion is demanded?

A. Manual

B. Automatic with a 4.0 °F Tave/Tref mismatch with reactor and turbine power stable

C. Control Bank "A"

D. Shutdown Bank "A"

Proposed Answer: D

Explanation (Optional):

A. Incorrect. 48 spm

B. Incorrect. A 4° mismatch will move CB "D" rods at approximately 40 spm (8 - 72 spm band).

C. Incorrect. 48 spm

D. Correct. 64 spm

Technical Reference(s): 2OM-1.2.B (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1C Objective 10 (As available)

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

Question History: 2SQS-1.3-010-1
BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Deleted given conditions per reviewer comments.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	4	
	K/A #	G2.4.15	
	Importance Rating	3.0	

Emergency Procedures/Plan: Knowledge of communications procedures associated with EOP implementation.

Question: RO 40

During the performance of the EOPS's when sounding the standby alarm, it shall be sounded _____ times for a test, _____ times for a fire casualty and _____ times for a Safety Injection actuation.

	Test	Fire	SI
A.	1	3	2
B.	2	3	1
C.	3	2	1
D.	3	1	2

Proposed Answer: B

Explanation (Optional):

A. Incorrect.

B. Correct. 1 for trip or SI, 2 for test or drill, 3 for fire, injury, casualty control or radiological spill.

C. Incorrect.

D. Incorrect.

Technical Reference(s): Control Board Placard (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3-02 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Replaced question for RO only because original question was beyond the scope of the RO task list and had no objective to support it.

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	3	3
Group #	4	4
K/A #	G2.4.15	
Importance Rating	3.0	3.5

Emergency Procedures/Plan: Knowledge of communications procedures associated with EOP implementation.

Question: 40 SRO

Given the following conditions:

- An event occurred at 1215 and an ALERT was declared at 1225.
- While in the process of filling out the ALERT notification form, a Site Area Emergency is declared at 1230.

Which ONE of the following describes the **LATEST** time that the state and counties shall be notified of the classification upgrade?

A. 1240

B. 1245

C 1325

D. 1330

Proposed Answer: B

Explanation (Optional):

A. Incorrect. 15 minutes from the time of the upgrade is allowed.

B. Correct.

C. Incorrect. 15 minutes allowed. Plausible because NRC notification is 1 hour.

D. Incorrect. Represents 1 hour from upgrade.

2LOT4 NRC Written Exam

Technical Reference(s): EPIP-I-1a, section 5 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History: Modified from 2001 Audit Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	005 AK3.03	
Importance Rating	3.6	4.1

Knowledge of the reasons for the following responses as they apply to the Inoperable/Stuck control Rod: Tech-Spec limits for rod mismatch.

Question: 41

This is an open reference question.

With the Unit operating at 90% power, one control rod is determined to be misaligned from its control bank by 14 steps.

Which ONE of the following describes the required operator action and the reason for the action?

A. Requires a reduction of thermal power providing assurance of fuel rod integrity during continued operation.

B. Requires a stabilization of thermal power providing assurance that minimum shutdown margin is maintained.

C. Requires a stabilization of thermal power providing assurance of fuel rod integrity during continued operation.

D. Requires a reduction of thermal power providing assurance that minimum shutdown margin is maintained.

Proposed Answer: A

Explanation (Optional):

A. Correct. AOP-2.1.8 specifies a thermal power reduction. T.S. Bases states action is required to provide assurance of fuel rod integrity.

B. Incorrect. Reduce power within one hour.

C. Incorrect. Reduce power within one hour.

D. Incorrect. Measuring peaking factors does not affect shutdown margin.

Technical Reference(s): 2OM-53C.4.2.1.8 (Attach if not previously provided)
TS 3.1.3 Bases

Proposed References to be provided to applicants during examination: TS 3.1.3.1

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	015 AA2.02	
Importance Rating	2.8	3.0

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Abnormalities in RCP air vent flow paths and/or oil cooling system.

Question: 42

Given the following:

- The Unit is at 100% power with all systems in their at-power NSA configuration.
- At 0900 [A2-5F], REACTOR COOLANT PUMP COOLING WATER TROUBLE alarmed and [2CCP-FI106A], 21A RCP LBLO Clg Wter Disch Flow indicated '0' gpm.
- At 0906, RCP 21A lower radial bearing temperature indicates 189°F and is rising at 2°F per minute.

Per 2OM-2.6.8, Abnormal RCP Operation, which ONE of the following is required?

A. Stop 21A RCP and close the unaffected loop spray valve.

B. Stop 21A RCP, trip the reactor, then perform immediate actions of E-0, Reactor Trip Or Safety Injection.

C. Trip the reactor, complete the immediate actions of E-0, Reactor Trip Or Safety Injection, then stop 21A RCP.

D. Reduce reactor power to less than 49% and then stop 21A RCP.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Required action is to trip the reactor, perform immediate actions of E-0 and then trip 21A RCP.

B. Incorrect. Required action is to trip the reactor, perform immediate actions of E-0 and then trip 21A RCP.

C. Correct.

D. Incorrect. Required action is to trip the reactor, perform immediate actions of E-0 and then trip 21A RCP.

Technical Reference(s): 2OM-6.4.AAG (Attach if not previously provided)
2OM-53C.4.2.6.8

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-6.3 Objective 21 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Changed per reviewer comment.

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	E09 EK3.4	
Importance Rating	3.4	3.0

Knowledge of the reasons for the following responses as they apply to the (Natural Circulation Operations): RO or SRO function as a member of the Control Room Team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.

Question: 43

Given the following conditions:

- The Unit was operating at 85% power with all systems in their at-power NSA configuration when a Unit trip and a loss of offsite power occurred.
- An RCS cooldown and depressurization was in progress per ES-0.2, Natural Circulation Cooldown when Pressurizer level began to exhibit **large unexpected** variations.

Which ONE of the following describes the reason for the Pressurizer level changes and the actions required to mitigate the condition?

	Reason	Action
A.	Void formation	Stop the depressurization
B.	Pressurizer out-surge	Maximize charging flow
C.	Void formation	Begin operating the CRDM cooling fans
D.	Pressurizer in-surge	Increase the cooldown rate

Proposed Answer: A

Explanation (Optional):

A. Correct. The depressurization is stopped if void formation is suspected.

B. Incorrect. Large unexpected variations in PRZR level indicate void formation.

C. Incorrect. CRDM cooling fans already operating.

D. Incorrect. Large unexpected variations in PRZR level indicate void formation.

Technical Reference(s): 2OM-53B.4.ES-0.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	E09 EA1.2	
Importance Rating	3.6	3.8

Ability to operate and / or monitor the following as they apply to the (Natural Circulation with Steam Void in Vessel with/without RVLIS): Operating behavior characteristics of the facility.

Question: 44

Following a reactor trip due to a loss of CCP, the crew is performing the actions of ES-0.2, Natural Circulation Cooldown.

The Unit Supervisor has determined that a transition to ES-0.3, Natural Circulation With Steam Voids In Vessel (With RVLIS) is required due to an indication of voiding in the vessel head and an RCS depressurization is required.

Which ONE of the following describes the response of RCS inventory indication as the RCS cooldown progresses?

A. Pressurizer level and RVLIS indication will rise.

B. Pressurizer level and RVLIS indication will lower.

C. Pressurizer level will rise and RVLIS indication will lower.

D. Pressurizer level will lower and RVLIS indication will rise.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Void formation in the head will lower RVLIS indication.

B. Incorrect. Void formation will displace water into the Pressurizer.

C. Correct.

D. Incorrect. Pressurizer level will rise and RVLIS indication will lower.

Technical Reference(s): 2OM-53B.4.ES-0.3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	026 AA1.06	
	Importance Rating	2.9	2.9

Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: Control of flow rates to components cooled by the CCWS.

Question: 45

Given the following conditions:

- The crew is responding to a Component Cooling Water System leak.
- "A" and "B" CCP headers have been split.
- The crew is isolating the "A" containment header in an attempt to identify the location of the leak.

After isolating the "A" containment header, which ONE of the following components will still be supplied with CCP flow?

A. Neutron Shield Tank Cooler

B. 21C RCP Thermal Barrier Heat Exchanger

C. Excess Letdown Heat Exchanger

D. Primary Drains Cooler

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Supplied from "A" containment header.

B. Correct.

C. Incorrect. Supplied from "A" containment header.

D. Incorrect. Supplied from "A" containment header.

Technical Reference(s): 2OM-15.4.AAC (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-15.1 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	026 AK3.02	
	Importance Rating	3.6	3.9

Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: The automatic actions (alignments) within the CCWS/Nuclear Service Water system resulting from the actuation of ESFAS.

Question: 46

Which ONE of the following describes the basis for the Component Cooling System **VALVE** realignment on a Containment Isolation Phase "B" actuation?

A. Reduces additional potential release paths from containment.

B. Reduces the heat load on the Component Cooling System by eliminating unnecessary cooling requirements.

C. Reduces emergency diesel generator loading requirements with Containment Spray in operation.

D. Reduces the severity of a containment pressure transient by eliminating potential energy sources.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Although RCP cooling is no longer required, it is not the reason for the CIB.

C. Incorrect. On a Containment Spray actuation, CCP trips.

D. Incorrect. CCS may be a potential energy source to containment, but is not considered a significant contributor. CIB is concerned with containment fission product barrier protection.

2LOT4 NRC Written Exam

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

_____

_____

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-15.1 Objective 16 (As available)

Question Source: Bank # X

Modified Bank # _____ (Note changes or attach parent)

New _____

Question History: Vendor Bank, Previous NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge _____

Comprehension or Analysis Comprehension

10 CFR Part 55 Content: 55.41 X

55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	040 EK1.1	
Importance Rating	3.4	3.8

Knowledge of the operational implications of the following concepts as they apply to the (Uncontrolled Depressurization of all Steam Generators): Components: capacity, and function of emergency systems.

Question: 47

Given the following conditions:

- The Unit is at 100% power with all systems in NSA.
- A steam line break occurs downstream of the 21A MSIV.
- A Main Steam Line Isolation Signal occurs.

Which ONE of the following describes the maximum allowable closure time of the MSIVs and the associated reason?

A. The MSIVs must close within 5 seconds to ensure RCS pressure doesn't drop below the automatic SI setpoint due to the RCS cooldown.

B. The MSIVs must close within 5 seconds to minimize the reactivity effects of the RCS cooldown.

C. The MSIVs must close within 30 seconds to limit the secondary inventory loss to the contents of one SG.

D. The MSIVs must close within 30 seconds to minimize the reactivity effects of the RCS cooldown.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Already actuated SI from the same signal that caused MSLI.

B. Correct.

C. Incorrect. 5 second time limit. Reason is for break upstream of the MSIVs.

D. Incorrect. 5 second time limit.

Technical Reference(s): TS 3.7.1.5 and Bases (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-21.1 Objective 17 (As available)

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

Question History: BVPS-1 NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	E08 EK1.2	
Importance Rating	3.4	4.0

Knowledge of the operational implications of the following concepts as they apply to the (Pressurized Thermal Shock): Normal, abnormal and emergency operating procedures associated with (Pressurized Thermal Shock).

Question: 48

FR-P.1, Response To Imminent Pressurized Thermal Shock Conditions has been entered on an Orange Path condition for the Vessel Integrity CSF Status Tree.

Which ONE of the following describes the actions taken in FR-P.1 and the reason for those actions?

A. Depressurize the RCS to maximize SI flow to the core.

B. Stabilize RCS pressure to minimize SI flow to the core.

C. Depressurize the RCS to minimize pressure stresses on the reactor vessel.

D. Stabilize RCS pressure to minimize temperature stresses on the Pressurizer.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Maximizing SI flow would increase the cooldown and increase temperature stresses on the reactor vessel.

B. Incorrect. SI flow is terminated if possible; however, reactor vessel pressure is reduced to a minimum, decreasing the pressure stresses on the reactor vessel.

C. Correct.

D. Incorrect. System pressure is reduced to a minimum to decrease the pressure stresses on the reactor vessel.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-53B.4.FR-P.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	051 AA1.04	
	Importance Rating	2.5	2.5

Ability to operate and / or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position.

Question: 49

Given the following conditions:

- The Unit is operating at 80% power with all systems in NSA.
- The Turbine is NOT on the limiter.
- The crew has determined that the condenser vacuum breaker is leaking.

Assuming no action has been taken by the crew, which ONE of the following describes the response of the rod control system to this event?

Control rods will automatically…

A. insert due to the rise in condenser vacuum.

B. insert due to the drop in condenser vacuum.

C. withdraw due to the rise in condenser vacuum.

D. withdraw due to the drop in condenser vacuum.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Rods withdraw and vacuum drops.

B. Incorrect. Rods withdraw.

C. Incorrect. Vacuum drops.

D. Correct. Vacuum breaker leak causes vacuum to drop, GV's to open, Tavg to drop, and rods to withdraw.

Technical Reference(s): 2OM-53C.4.2.51.1 (Attach if not previously provided)
2OM-53C.4.2.26.2

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-53C.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	024 AA1.07	
	Importance Rating	3.3	3.4

Ability to operate and/or monitor the following as they apply to the Emergency Boration: BWST level.

Question: 50

Given the following conditions:

- An ATWS has occurred.
- The crew is performing the actions in FR-S.1, Response To Nuclear Power Generation/ATWS.
- The Reactor Operator has started an emergency boration by opening [2CHS*MOV350], Emergency Borate Valve.
- All equipment has operated as designed.
- SI is NOT actuated.
- RCS pressure is 2210 psig and trending DOWN.
- Tavg is 567°F and trending DOWN.

Which ONE of the following describes the plant response to the above listed conditions?

A. Boric Acid Tank level will drop at a rate approximately equal to boration flow.

B. Volume Control Tank level will drop at a rate approximately equal to charging flow.

C. Refueling Water Storage Tank level will drop at a rate approximately equal to charging flow.

D. Pressurizer level will rise at a level approximately equal to charging flow.

Proposed Answer: A

Explanation (Optional):

A. Correct. The BAT will supply borated water.

B. Incorrect. VCT level may actually rise because there is no outflow, and letdown may still be flowing.

C. Incorrect. RWST is not supplying any water unless equipment does not work properly or SI is initiated.

D. Incorrect. In an ATWS, Pressurizer level is also in a transient state due to RCS mass changing from temperature changing.

Technical Reference(s): 2OM-53A.1.FR-S.1, Step 7 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53.3 Objective 2 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	062 G2.4.6	
Importance Rating	3.1	4.0

Emergency Procedures/Plan: Knowledge of symptom based EOP mitigation strategies.

Question: 51

Due to a loss of Service Water System pressure, the crew is performing actions contained in AOP-2.30.1, Service Water/Normal Intake Structure loss.

Service Water pressure continues to drop, and the US has decided to trip the reactor and enter E-0, Reactor Trip or Safety Injection.

Which ONE of the following describes the use of AOP-2.30.1 when the reactor is tripped?

A. Discontinue use of AOP-2.30.1. All applicable steps are performed in E-0.

B. Applicable steps of AOP-2.30.1 should be performed prior to taking action in E-0.

C. Applicable steps of AOP-2.30.1 may be performed concurrently with the actions contained in E-0.

D. Perform actions of E-0. Perform applicable steps of AOP-2.30.1 when directed to in the EOP network.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. The AOP directs concurrent use.

B. Incorrect. Once the reactor is tripped, E-0 must be performed first.

C. Correct.

D. Incorrect. There is no directive in EOPs for concurrent AOP action.

Technical Reference(s): AOP-2.30.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-30.1 Objective 18 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	067 AA2.13	
Importance Rating	3.3	4.4

Ability to determine and interpret the following as they apply to the Plant Fire on Site: Need for emergency plant shutdown.

Question: 52

A large fire in which ONE of the following areas would result in a Control Room evacuation and require a plant shutdown using 2OM-56C.1.B, Alternate Safe Shutdown From Outside Control Room?

A. Battery Room 2-1

B. Cable Spreading Room

C. MCC*2-E03 Room

D. North Safeguards (Orange Train)

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Even though some equipment indication and control is lost, actual CR control is not lost.

B. Correct.

C. Incorrect. Vital switchgear room does not affect CR control.

D. Incorrect. CR control is unaffected, although orange train equipment would not be available.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-56.C.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	068 AA1.31	
Importance Rating	3.9	4.0

Ability to operate and / or monitor the following as they apply to the Control Room evacuation: EDG.

Question: 53

Given the following:

- The Control Room is being evacuated due to a toxic atmosphere.
- The crew is preparing to evacuate in accordance with AOP-2.33.1A, Control Room Inaccessibility.
- All equipment is operating as required.

Which ONE of the following describes the operation of the emergency diesel generators (EDGs) during this evolution?

A. EDGs are started and vital equipment is loaded from the control room. Control is transferred to the Emergency Shutdown Panel after evacuation.

B. EDGs remain in standby status. Control is switched to the Emergency Shutdown Panel after evacuation.

C. EDGs remain in standby status. Control is transferred to the local control panel from the Control Room prior to evacuation.

D. EDG control is switched to the local control panel after evacuation. EDGs are started and vital equipment is loaded as soon as local control is established.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The EDGs are not started, if not required.

B. Correct.

C. Incorrect. Local control is not available from CR switch.

D. Incorrect. The EDGs are only run if required.

Technical Reference(s): AOP-2.33.1A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-53C.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	069 G2.1.32	
Importance Rating	3.4	3.8

Conduct of Operations: Ability to explain and apply all system limits and precautions.

Question: 54

Which ONE (1) of the following describes the requirements for containment airlock integrity?

Containment airlock integrity is required in modes...

A. 1, 2, and 3 only. One containment airlock is required to be operable.

B. 1, 2, 3 and 4 only. One containment airlock is required to be operable.

C. 1, 2, and 3 only. Two containment airlocks are required to be operable.

D. 1, 2, 3, and 4 only. Two containment airlocks are required to be operable.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. 2 air locks required.

B. Incorrect. 2 air locks required.

C. Incorrect. Also applies in Mode 4.

D. Correct.

Technical Reference(s): 2OM-47.2.A (Attach if not previously provided)
T.S. 3.6.1.3 Bases

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-47.1 Objectives 2, 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	074 EK2.1	
Importance Rating	3.1	3.8

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

Question: 55

Following a LOCA with subsequent ECCS failures, the crew is performing the actions in FR-C.2, Response To Degraded Core Cooling.

Which ONE of the following describes the operation of the Pressurizer PORVs in FR-C.2?

A. Used to establish a vent path prior to RCP restart.

B. Allowed to operate automatically or operated manually for RCS overpressure control.

C. Remain isolated with block valves closed to prevent further loss of RCS inventory.

D. Used to depressurize the RCS to facilitate SI accumulator injection.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The PORVs are not used for RCP vent paths and there is no provision in FR-C.2 for RCP restart.

B. Correct.

C. Incorrect. The PORVs are verified closed with block valves open as long as pressure is below setpoint.

D. Incorrect. This is an action possibly taken in FR-C.1.

Technical Reference(s): 2OM-53A.1.FR-C.2 (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-43.3 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	1	1
K/A #	076 AK3.05	
Importance Rating	2.9	3.6

Knowledge of the reasons for the following responses as they apply to the High Reactor Coolant Activity: Corrective actions as a result of high fission-product radioactivity level in the RCS.

Question: 56

Given the following conditions:

- A rapid load reduction from 100% power to 65% power was performed approximately 3 hours ago.
- [2CHS-RQI101A], Reactor Coolant Letdown Low Range Monitor is in HIGH alarm.
- [2CHS-RQI101B], Reactor Coolant Letdown High Range Monitor has just reached its ALERT alarm setpoint.
- Chemistry confirms RCS activity exceeds TS 3.4.8 limits.

The Unit Supervisor directs that a plant shutdown be performed.

Which ONE of the following describes a **REQUIRED** action due to the high RCS activity, and the reason the action is performed?

A. MSIVs are closed to limit potential secondary system contamination in the case where primary to secondary leakage is at its Technical Specification maximum limit.

B. SG atmospheric dump valve setpoints are raised to limit the radioactive release in the event of a SGTR.

C. RCS is cooled down below 500°F to limit the radioactive release in the event of a SGTR.

D. Maximum condensate polishers are placed in service to limit secondary contamination in the case where primary-to-secondary leakage is at its Technical Specification maximum limit.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Closing MSIVs would contribute to a release through SG ADVs and safety valves if cooldown and depressurization were not performed in a timely manner.

B. Incorrect. SG ADV setpoints are normally raised in SGTR procedure.

C. Correct.

D. Incorrect. Condensate polishing would help clean the secondary plant, but is not an action performed in response to high activity.

Technical Reference(s): T.S. 3.4.8 (Attach if not previously provided)
2OM-43.4.AAC

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-43.1 Objectives 9 and 10 (As available)

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

Question History: Vendor Bank, Previous NRC

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	2
K/A #	008 AA1.07	
Importance Rating	4.0	4.2

Ability to operate and / or monitor the following as they apply to the Pressurizer Vapor Space Accident: Reseating of code safety and PORV.

Question: 57

A transient has occurred resulting in the following conditions:

- A reactor trip and safety injection.
- RCS pressure is 1050 psig and lowering.
- RCS temperature is 545°F.
- Pressurizer level is 78% and rising.
- RCPs are tripped.

The crew is performing E-0, Reactor Trip Or Safety Injection, when the following plant conditions develop:

- RCS pressure is 1200 psig and rising slowly.
- RCS temperature is 545°F.
- Pressurizer level is 62% and rising.

Which ONE of the following describes the cause of the changing conditions?

A. The size of the RCS leak has increased.

B. A faulted steam generator has boiled dry.

C. A Pressurizer safety valve or PORV has reseated.

D. The turbine failed to trip and the MSIVs were closed.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. RCS pressure would drop if the leak size had increased.

B. Incorrect. Pressurizer level would act in the opposite way if the faulted SG boiled dry.

C. Correct.

D. Incorrect. If the turbine failed to trip, Pressurizer level would act in the opposite way.

Technical Reference(s): Simulator Response (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-6.4 Objective 20 (As available)

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

Question History: Vendor Bank, Previous NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	2
K/A #	008 AA2.19	
Importance Rating	3.4	3.6

Ability to determine or interpret the following as they apply to a pressurizer vapor space accident: Pressurizer Spray Valve failure, using plant parameters.

Question: 58

Given the following conditions:

- The Unit is at 63% power.
- Pressurizer pressure is at 2180 psig and trending DOWN slowly.
- Pressurizer level is stable at program level.
- VCT level is stable.
- Pressurizer vapor space and water temperatures are approximately 630°F and trending DOWN slowly.

Which ONE of the following events is in progress?

A. Pressurizer spray valve has failed open.

B. Pressurizer safety valve is leaking.

C. The Pressurizer surge line has a leak.

D. Pressurizer pressure instrument has failed low.

Proposed Answer: A

Explanation (Optional):

A. Correct. Temperature and pressure drop slowly during a spray valve failure.

B. Incorrect. For a safety valve leak temperature remains constant.

C. Incorrect. For a surge line leak, level would drop in either the VCT or PRZR.

D. Incorrect. Heaters would energize to raise PRZR pressure on a pressure instrument failed low.

Technical Reference(s): Simulator Response (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-6.4 Objective 20 (As available)

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

Question History: Vendor Bank (Previous NRC Exam)

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	1
K/A #	011 EA2.10	
Importance Rating	4.5	4.7

Ability to determine or interpret the following as they apply to a Large Break LOCA: Verification of adequate core cooling.

Question: 59

Given the following conditions:

- A LOCA has occurred.
- The crew is performing the actions in E-0, Reactor Trip Or Safety Injection.
- RCS Tavg is 535°F and trending DOWN.
- RCS subcooling has been lost.
- Containment pressure is 1 psig and RISING slowly.
- There are no HHSI pumps running or available to start.
- All CSF Status Trees are YELLOW or GREEN.

Which ONE of the following describes the required operation of the RCPs and the reason for the action?

A. All RCPs must be tripped immediately to prevent core uncovery and an inadequate core cooling condition due to the mass being pumped out of the RCS break.

B. All RCPs must be tripped immediately because the two-phase flow is creating an artificially high vessel level indication and core uncovery will eventually occur if RCPs are left running.

C. Running RCPs must remain in operation because there is no other source of core cooling.

D. One RCP must immediately be stopped to save for future use in the Functional Recovery Procedures.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. RCP trip criteria has not been met with no SI pumps available.

B. Incorrect. RCP trip criteria has not been met with no SI pumps available.

C. Correct.

D. Incorrect. An action that may be performed in FR-C-2.

Technical Reference(s): 2OM-53B.4 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History: Vendor Bank, Previous NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	1
K/A #	E04 EA1.2	
Importance Rating	3.6	3.8

Ability to operate and / or monitor the following as they apply to the (LOCA Outside Containment): Operating behavior characteristics of the facility.

Question: 60

Given the following conditions:

- A LOCA outside containment has occurred.
- The crew is performing the actions in ECA-1.2, LOCA Outside Containment.

Which ONE of the following indications is used to determine if the leak has been isolated in accordance with ECA-1.2?

A. RCS pressure

B. Pressurizer level

C. RVLIS indication

D. Safety injection flow

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Pressurizer level may be off-scale low and verification could be delayed.

C. Incorrect. Other E-1 series procedures use RVLIS as an indication but other factors would also change level.

D. Incorrect. As RCS pressure rises, ECCS flow drops, but the indication is not used in ECA-1.2.

Technical Reference(s): 2OM-53A.1.ECA-1.2, Step 4 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 23 (As available)

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

Question History: Vendor Bank, Previous NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	1
K/A #	E01 EK2.2	
Importance Rating	3.5	3.9

Knowledge of the interrelations between the (SI Termination) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Question: 61

Given the following conditions:

- A reactor trip and safety injection have occurred.
- The crew is performing the actions in E-0, Reactor Trip Or Safety Injection.
- While evaluating criteria for transition to ES-1.1, SI Termination, the following conditions exist:
    - All RCPs are running.
    - RCS pressure is 1880 psig and stable.
    - Pressurizer level is 20% and RISING slowly.
    - Containment pressure is 10 psia and stable.
    - ALL narrow range SG levels are offscale low.
    - AFW flow is 140 gpm to each SG.

Which ONE of the following describes the action required with respect to transition to ES-1.1?

A. The entry conditions are met to transition to ES-1.1.

B. Raise AFW flow to greater than 340 gpm to each SG prior to transitioning to ES-1.1.

C. Raise SG levels to greater than 12% in at least one SG prior to transitioning to ES-1.1.

D. Raise Pressurizer level to greater than 47% prior to transitioning to ES-1.1.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. AFW total flow is required to be greater than 340 gpm and is already met.

C. Incorrect. SG levels are not required if AFW flow criteria is satisfied.

D. Incorrect. Pressurizer level of 17% is the minimum. 47% is for adverse containment.

Technical Reference(s): 2OM-53A.1.E-0 (Attach if not previously provided)
2OM-53A.1.ES-1.1

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	E03 EA1.2	
	Importance Rating	3.7	3.9

Ability to operate and / or monitor the following as they apply to the Post LOCA Cooldown and Depressurization: Operating behavior characteristics of the facility.

Question: 62

Given the following:

- A small break LOCA has occurred. The crew is in ES-1.2, Post LOCA Cooldown And Depressurization.
- RCS subcooling is 45°F. The crew has determined that one Charging/HHSI pump can be stopped.

Which ONE of the following explains what will happen to the value of subcooling when the selected charging pump is stopped?

A. Lowers because break flow remains constant while ECCS flow is reduced. RCS temperature rises and stabilizes at a higher value.

B. Lowers as RCS pressure lowers in response to reduced ECCS flow. Stabilizes at a lower value when break flow equals ECCS flow.

C. Remains the same. Flow from the running Charging/HHSI pump rises, reaching a balance with break flow.

D. Remains the same. RCS temperature rises in response to the reduced ECCS flow, but RCS pressure also rises.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Temperature is controlled by steam dump and is not expected to rise.

B. Correct.

C. Incorrect. Subcooling is reduced as a result of lower ECCS flow.

D. Incorrect. Temperature does not rise.

Technical Reference(s): 2OM-53B.4.ES-1.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 5 (As available)

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

Question History: Vendor Bank, BVPS-1 Audit Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	2
K/A #	025 AA1.02	
Importance Rating	3.8	3.9

Ability to operate and / or monitor the following as they apply to the Loss of Residual Heat Removal System: RCS inventory.

Question: 63

This is an open reference question.

Given the following conditions:

- The Unit is in Mode 5.
- The Unit has been shutdown for 75 hours.
- An RCS break has resulted in a loss of RCS inventory and manually tripping of the RHR pumps.
- PRZR level is offscale low.
- The operators are in AOP-2.10.1, Residual Heat Removal System Loss, at Step 16 - Attempt To Provide Alternate Core Cooling.

Per the provided reference, AOP-2.10.1, Residual Heat Removal System Loss, which ONE of the following describes how RCS inventory is to be restored?

A. Establish a minimum of 80 gpm from the Charging/HHSI pumps from the RWST until the desired PRZR level is obtained.

B. Establish a minimum of 160 gpm from the Charging/HHSI pumps from the RWST until the desired PRZR level is obtained.

C. Manually actuate SI, verify all SI equipment has properly aligned, and maintain this configuration until the desired PRZR level is obtained.

D. Manually actuate SI, verify all SI equipment has properly aligned, and maintain this configuration until SI termination criteria is established.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Boil off rate is 80 gpm, required charging flow is 2-3 times boil off rate or 160 - 240 gpm.

B. Correct. Minimum flowrate is 2-3 times boil off rate which is 80 gpm per attachment 3.

C. Incorrect. Do NOT actuate SI in Mode 5. (AOP-2.6.5)

D. Incorrect. Do NOT actuate SI in Mode 5. (AOP-2.6.5)

Technical Reference(s): 2OM-53C.4.2.10.1, Step 17 and Attachment 3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: AOP-2.10.1

Learning Objective: 3SQS-53.C.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Replaced question because BVPS does not utilize mid-loop operations.

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	2
K/A #	033 AA2.03	
Importance Rating	2.8	3.1

Ability to determine and interpret the following as they apply to Loss of Intermediate Range NI: Indication of blown fuse.

Question: 64

Given the following conditions:

- A reactor startup is in progress.
- Reactor power is at $1X10^{-9}$ amps on both Intermediate Range (IR) channels.

Which ONE of the following describes the plant response to a blown control power fuse on IR Channel N-36?

A. The reactor trips and the fuse holder for the blown fuse is lit.

B. The reactor trips and the fuse holder for the blown fuse is extinguished.

C. The plant remains at present power; the fuse holder for the blown fuse is lit.

D. The plant remains at present power; the fuse holder for the blown fuse is extinguished.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. The fuse holder lights when the circuit is broken.

C. Incorrect. The reactor will trip on IR high flux trip due to the loss of power (1/2 logic).

D. Incorrect. The reactor will trip and the fuse holder will be lit.

Technical Reference(s): 2OM-2.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1 Objectives 7 and 8 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	029 EK3.10	
	Importance Rating	4.1	4.1

Knowledge of the reasons for the following responses as they apply to the ATWS: Manual rod insertion.

Question: 65

Which ONE of the following describes an **IMMEDIATE** operator action during an ATWS event and the reason for the action?

A. Control rod insertion to restore the core to a subcritical state.

B. Emergency boration to restore the core to a subcritical state.

C. Emergency boration to establish and maintain shutdown margin.

D. Control rod insertion to establish and maintain shutdown margin.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Not an immediate operator action.

C. Incorrect. Not an immediate operator action.

D. Incorrect. Restoration of shutdown margin is desired, but is not necessary to exit FR-S.1. Rod insertion is only necessary to reduce reactor power.

Technical Reference(s): 2OM-53B.4.FR-S.1 (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-53.3 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	032 AA2.05	
	Importance Rating	2.9	3.2

Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation: Nature of abnormality, from rapid survey of control room data.

Question: 66

Given the following conditions:

- A reactor startup is in progress.
- The reactor trips on Source Range High Flux.
- The following conditions existed at the time of the reactor trip:
  - IR Channel N-35 indicated 4×10^{-11} amps.
  - IR Channel N-36 indicated 7×10^{-11} amps.
  - The crew was verifying proper overlap and preparing to block the SR High Flux Trip.

Which ONE of the following was the cause of the reactor trip?

A. IR Channel N-35 failed low causing the trip when P-6 cleared.

B. IR Channel N-36 was overcompensated and caused the trip prior to P-6 being satisfied.

C. SR N-31 pulse height discrimination circuit failed causing an artificially high indication.

D. SR N-32 failed low causing the negative rate bistable to trip.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. P-6 not yet satisfied.

B. Incorrect. N-36 is reading higher than N-35 so it is not overcompensated.

C. Correct. If the pulse height discriminator is set too low, higher readings will result.

D. Incorrect. SR does not have a negative rate trip.

Technical Reference(s): 2OM-2.1, Figure 2.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1 Objective 14 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	2
K/A #	009 EK3.21	
Importance Rating	4.2	4.5

Knowledge of the reasons for the following responses as they apply to Small Break LOCA: Actions contained in EOP for Small Break LOCA.

Question: 67

Given the following conditions:

- A small break LOCA has occurred.
- The crew is performing the actions in ES-1.2, Post LOCA Cooldown And Depressurization.
- SI pumps have been stopped.
- Normal charging is aligned.
- The crew is depressurizing the RCS using normal spray.

Which ONE of the following describes the strategy and the basis for the continuing depressurization?

A. Maximize subcooling to ensure continued RCP operation.

B. Minimize subcooling to reduce RCS break flow.

C. Maximize subcooling to prevent a challenge to the Core Cooling CSF.

D. Minimize subcooling to ensure Pressurizer level remains above the lower limit to allow heater operation during the RCS cooldown.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. RCP operation is not required for this event, although desired.

B. Correct. Strategy is to depressurize and attempt to minimize subcooling so that break flow is reduced due to the minimal makeup provided by charging pumps.

C. Incorrect. Core cooling should not be challenged on a loss of subcooling at these temperatures and pressures at this point in the cooldown.

D. Incorrect. Heater operation may be required to reduce the rate of increase in Pressurizer level, but is not the reason for minimizing subcooling.

Technical Reference(s): 2OM-53B.4.ES-1.2 (Attach if not previously provided)
2OM-53A.1.ES-1.2, Step 24

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History: Vendor Bank, Previous NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	038 EA1.02	
	Importance Rating	4.2	4.1

Ability to operate and monitor the following as they apply to a SGTR: Steam and feedwater flow, for mismatched condition.

Question: 68

Given the following conditions:

- The Unit is operating at 100% power with all systems in NSA.
- RCS pressure is 2100 psig and trending DOWN.
- Pressurizer level is 5% below program and trending DOWN.

Prior to any action by the crew, which ONE of the following would be the first indication of a Steam Generator Tube Rupture?

A. Affected SG steam flow rises; feed flow remains unchanged.

B. Affected SG level rises uncontrollably.

C. Affected SG steam flow remains constant; feed flow trends down.

D. Unaffected SG levels trend down until overridden by the level program.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. There is nothing causing steam flow to rise, although the distractor indicates a steam/feed mismatch.

B. Incorrect. High power pre-trip, SG level will be controlled by feedwater control system. Indication is for post-trip.

C. Correct.

D. Incorrect. It describes a reaction either to an instrument failure, or a wrong reaction to the SG level control of the affected SG.

Technical Reference(s): Simulator Response (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	2	2
K/A #	054 AA1.04	
Importance Rating	4.4	4.5

Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW): HPI, under total feedwater loss conditions.

Question: 69

Given the following:

- The crew is responding to an event and is currently in FR-H.1, Response To Loss of Secondary Heat Sink.
- Attempts to restore feedwater flow have failed.
- RCS bleed and feed has been established with one PRZR PORV open.
- The other two PORVs will NOT open.

Which ONE of the following actions is required to be taken?

A. Terminate attempts to establish a SG heat sink because one PRZR PORV will provide sufficient bleed flow to permit adequate RCS heat removal.

B. Continue attempts to open the failed PRZR PORVs and reduce SI flow as necessary to prevent rapid overpressurization of the RCS.

C. Establish alternate RCS bleed paths because one PRZR PORV may not depressurize the RCS sufficiently to permit adequate cooling from the SI flow.

D. Terminate RCS bleed and feed because with only one PRZR PORV open, RCS pressure will rise causing SI flow and RCS inventory to drop.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Efforts to establish a heat sink are on-going.

B. Incorrect. SI flow should not be reduced.

C. Correct.

D. Incorrect. Bleed and feed should not be terminated, although if no other vent paths can be opened, there may be insufficient feed.

Technical Reference(s): 2OM-53B.4.FR-H.1, Step 17 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History: 2001 BVPS-2 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	E05 EA1.1	
	Importance Rating	4.1	4.0

Ability to operate and / or monitor the following as they apply to the (Loss of Secondary Heat Sink): Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Question: 70

A reactor trip has occurred.

The following conditions exist:

- The crew has just entered FR-H.1, Response To Loss of Secondary Heat Sink.
- RCS pressure is 2240 psig.
- SG pressure is 1040 psig.
- SG levels are 50% WR and slowly trending DOWN.
- Total AFW flow is '0' gpm.

Which of the following actions is performed next?

A. Stop RCPs and attempt to initiate main feedwater flow.

B. Stop RCPs and establish bleed and feed cooling of the RCS.

C. Return to E-1, Loss Of Reactor Or Secondary Coolant for the LOCA in progress.

D. Depressurize SG's and initiate feed using the condensate pumps.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Action only required if SG WR level is less than 13% (31% adverse).

C. Incorrect. No LOCA indicated. RCS pressure is greater than SG pressures.

D. Incorrect. Action may be taken if AFW cannot be restarted and MFW cannot be started.

Technical Reference(s): 2OM-53A.1.FR-H.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 5 (As available)

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

Question History: Vendor Bank, Previous NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	058 AA2.02	
	Importance Rating	3.3	

Ability to determine and interpret the following as they apply to Loss of DC power: 125 VDC bus voltage, low/critical low voltage alarm.

Question: RO 71

Given the following conditions:

- The Unit is at 60% power. All systems are in NSA.
- [A8-9A], 125VDC BUS 2-1 TROUBLE is received in the Control Room.
- Computer alarm BAT *2-1 CHARGER TRBL has printed.

Several minutes after the alarms are received:

- The Unit continues to operate at 60% power.
- Control power remains available to EDG No. 2-1 and 4160V Bus "2AE".
- 125VDC Bus 2-1 voltage indicates approximately 124VDC.
- Battery Charger Breaker No. 2-1 has been verified closed and 480V MCC*2-E05 is energized.

For the given indications, which ONE of the following describes the 125VDC Bus 2-1 status?

A. Station Battery has failed. Battery Charger 2-1 is supplying the bus.

B. Battery Charger 2-1 has failed. Station Battery is supplying 125VDC Bus 2-1.

C. Station Battery <u>and</u> Battery Charger 2-1 have failed. 125VDC Bus 2-1 is deenergized.

D. Battery Charger 2-1 <u>and</u> Station Battery are operating normally. Battery Charger is supplying 125VDC Bus 2-1.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. If Battery Charger 2-1 were supplying the bus, DC bus voltage would indicate between 127.8V and 135V.

B. Correct. When a battery charger is lost, the station battery will automatically supply power to the loads on the effected bus. Without the float charge normally provided by the battery charger, DC bus voltage will not be maintained between 127.8V and 135V.

C. Incorrect. Would have resulted in a loss of control power to EDG No. 2-1 and 4160V Bus 2AE.

D. Incorrect. If Battery Charger 2-1 and Station Battery are operating normally the alarms would not have been received. Also, if Battery Charger 2-1 were supplying the normal bus loads, DC bus voltage would indicate between 127.8V and 135V.

Technical Reference(s): 2OM-39.4 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-39.1 Objective 12 (As available)

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

Question History: Editorially modified from BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	058 AA2.02	
	Importance Rating	3.3	3.6

Ability to determine and interpret the following as they apply to Loss of DC power: 125 VDC bus voltage, low/critical low voltage alarm.

Question: SRO 71

Given the following conditions:

- The Unit is at 100% power with all systems in NSA.
- The following annunciators are received in the Control Room:
  - [A8-9A], 125V DC BUS 2-1 TROUBLE
  - [A1-1A], DC DISTRIBUTION PANEL LOSS OF CONTROL DC
- 125 Volt DC Bus 2-1 voltage indicates '0' volts.
- The crew enters AOP-2.39.1, Loss Of 125VDC Bus.

Which ONE of the following describes the action required for this condition?

A. Immediately perform 2OM-39.4.AAD, 125V DC Bus 2-1 Trouble to restore power to DC Bus 2-1.

B. Enter E-0, Reactor Trip Or Safety Injection and concurrently perform 2OM-39.4.AAD, 125V DC Bus 2-1 Trouble upon completion of the Immediate Manual Actions.

C. Enter E-0, Reactor Trip Or Safety injection and perform 2OM-39.4.AAD, 125V DC Bus 2-1 Trouble when directed to go to procedure and step in effect in ES-0.1, Reactor Trip Response.

D. Immediately perform 2OM-39.4.D, Placing Spare Battery Charger In Service to restore power to DC Bus 2-1.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Condition requires a reactor trip and entry to E-0 per AOP-2.39.1.

B. Correct.

C. Incorrect. Condition requires a reactor trip per AOP-2.39.1. ARP used to assist in stabilizing the plant and may be used concurrently.

D. Incorrect. Action required if only the battery charger had failed.

Technical Reference(s): 2OM-53C.4.2.39.1 (Attach if not previously provided)
2OM-39.4.AAD

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-53.C.1 Objective 5 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must assess failures present and determine appropriate procedure entry.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
	K/A #	036 AK1.03	
	Importance Rating	4.0	4.3

Knowledge of the operational implications of the following concepts as they apply to Fuel Handling Incidents: Indications of approaching criticality.

Question: 72

The Unit is in Mode 6 with fuel movement in progress.

An event occurs that requires entry into AOP-2.49.1, Irradiated Fuel Damage While Refueling.

Which ONE of the following indications would exist for an inadvertent criticality that would **NOT** exist for a damaged fuel assembly?

A. Containment radiation monitor in alarm.

B. Containment purge isolation.

C. Source range NI count rate rising.

D. Visual indication of bubbles rising to the refueling cavity surface. CETs at 130°F.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Radiation monitor levels will rise for either event.

B. Incorrect. Containment purge is isolated by high radiation for either event.

C. Correct.

D. Incorrect. More likely an indication of fuel damage. Fuel is pressurized and leakage would be indicated as bubbles rising to the surface.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-53C.4.2.49.1 (Attach if not previously provided)
T.S. 3.9.2 Bases

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	3	3
K/A #	056 AA2.53	
Importance Rating	2.9	3.2

Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Status of emergency bus under voltage relays.

Question: 73

Given the following conditions:

- The Unit is operating at 47% power with all systems in NSA.
- The following alarms are received in the Control Room:
  - [A8-2C], 4160V Emerg Bus 2AE Undervoltage
  - [A8-2A], 4160V Emerg Bus 2AE ACB 2A10 Auto-Trip

All equipment responds as designed.

Which ONE of the following describes the status of emergency bus "2AE" and associated undervoltage relays 90 seconds after the event?

Bus "2AE" is...

A. energized; the undervoltage relays are energized.

B. energized; the undervoltage relays are de-energized.

C. de-energized; the undervoltage relays are energized.

D. de-energized; the undervoltage relays are de-energized.

Proposed Answer: A

Explanation (Optional):

A. Correct. Relays de-energize on a loss of power initiating EDG start sequence to re-energize the bus.

B. Incorrect. The relays are energized if the bus is energized.

C. Incorrect. The EDG will re-energize the bus since there is no indication of a fault.

D. Incorrect. The indication that would exist if the EDG did not energize the bus.

Technical Reference(s): 2OM-53C.4.2.36.2 (Attach if not previously provided)
2OM-36.4.ACE

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	1
Group #	3	3
K/A #	E15 G2.1.27	
Importance Rating	3.4	2.9

Conduct of Operations: Knowledge of system purpose and or function.

Question: 74

Given the following conditions:

- A LOCA has occurred.
- Due to an abnormal rise in containment sump level, the crew has transitioned to FR-Z.2, Response To Containment Flooding.

Which ONE of the following identifies the concern associated with the actions in this procedure?

A. Dilution of sump water may potentially cause a post-LOCA reactivity transient resulting in loss of subcriticality.

B. Contaminants in water from other systems can potentially block flow channels during the long term cooling phase of the recovery.

C. Water introduced into the sump beyond the capacity to contain it in appropriate areas can potentially affect the operation of vital equipment.

D. Loss of inventory from interfacing cooling systems can potentially result in a loss of ability to remove heat from the reactor core.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Procedure does not consider reactivity anomaly.

B. Incorrect. Other systems may contain contaminants but post-LOCA not a major threat to cooling.

C. Correct.

D. Incorrect. The major concern is flooding for this procedure. Loss of ability to remove heat is dealt with in other procedures.

Technical Reference(s): 2OM-53A.1.FR-Z.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	4	
	K/A #	G2.4.16	
	Importance Rating	3.0	

Emergency Procedures/Plan: Knowledge of EOP implementation hierarchy and coordination with other support procedures.

Question: RO 75

Which ONE of the following describes the EOP implementation hierarchy in the event of a reactor trip concurrent with a loss of AC power to all AC emergency busses?

A. Enter ECA-0.0, Loss Of All AC Power directly. Suspend actions in ECA-0.0 and enter the appropriate FRP only upon a CSF Status Tree RED path condition.

B. Enter ECA-0.0, Loss Of All AC Power directly and regardless of the CSF Status Trees, continue in ECA-0.0 until AC power is restored to the AC emergency busses.

C. Transition to ECA-0.0, Loss Of All AC Power from E-0, Reactor Trip Or Safety Injection. Suspend actions in ECA-0.0 and enter the appropriate FRP only upon a CSF Status Tree RED path condition.

D. Transition to ECA-0.0, Loss Of All AC Power from E-0, Reactor Trip Or Safety Injection. Suspend actions in ECA-0.0 and enter the appropriate FRP upon any CSF Status Tree ORANGE or RED path condition.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Because no AC powered safeguards equipment is available, FRPs cannot be implemented. Remain in ECA-0.0 until power is restored.

B. Correct.

C. Incorrect. ECA-0.0 is entered directly.

D. Incorrect. ECA-0.0 is entered directly.

2LOT4 NRC Written Exam

Technical Reference(s): 1/2OM-53B.2 (ISS1C) (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.1 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		3
	K/A #	G2.3.3	
	Importance Rating		2.9

Radiation Control: Knowledge of SRO responsibilities for auxiliary systems that are outside the control room. (e.g., waste disposal and handling systems).

Question: SRO 75

Which of the following signatures are required on the RWDA-L prior to releasing radioactive liquid from the Unit 2 Liquid Waste System?

1. Unit 1 Shift Manager
2. Unit 2 Shift Manager
3. Health Physics
4. Chemistry

A. 1, 3 and 4 only

B. 3 and 4 only

C. 2 and 4 only

D. 1, 2, 3, and 4

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Both Shift Managers have to sign.

B. Incorrect. Both Shift Managers have to sign.

C. Incorrect. Both Shift Managers and Health Physics have to sign.

D. Correct.

Technical Reference(s): 1/2OM-17.4A.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-17.1 Objective 11 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 4 because the SRO must know the requirements for release of radioactive effluents to unrestricted areas in accordance with facility procedures and 10CFR20.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	007 EA1.07	
	Importance Rating	4.3	

Ability to operate and / or monitor the following as they apply to the Reactor trip: MT/G trip; verification that the MT/G has been tripped.

Question: RO 76

The reactor has tripped from 100% power.

Which ONE of the following describes the **MINIMUM** requirement for verification of turbine trip in accordance with E-0, Reactor Trip Or Safety Injection?

A. All governor valves closed.

B. All throttle valves closed.

C. All governor valves closed <u>or</u> all interceptor valves closed.

D. All throttle valves closed <u>and</u> all reheat stop valves closed.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Represents the first part of the verification only.

B. Incorrect. Represents the first part of the verification only.

C. Incorrect. Both verifications are required.

D. Correct.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-53A.1.E-0, Step 3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.5 Objective 3 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 X

55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	001 G2.4.49	
	Importance Rating		4.0

Emergency Procedures / Plan: Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Question: SRO 76

Given the following:

- The Unit is operating at 100% power with all systems in NSA.
- Control Bank "D" is at 216 steps and begins an unexpected continuous insertion.
- Control rod step counters are counting.
- [A4-3C], TAVG DEVIATION FROM TREF has alarmed.
- Main generator megawatt output is stable.

According to AOP-2.1.3, RCCA Control Bank Inappropriate Continuous Movement, which ONE of the following describes the **NEXT** action required?

A. Manually trip the reactor and enter E-0, Reactor Trip Or Safety Injection.

B. Check RCS T_{AVG} within +/- 4°F of T_{REF} and adjust turbine load as necessary.

C. Initiate an emergency boration until control rod movement has stopped.

D. Place Control Rod Group Selector in 'MANUAL' and ensure rod motion has stopped.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Not required unless rod motion continues after placing in 'MANUAL'.

B. Incorrect. Not required per AOP-2.1.3.

C. Incorrect. Action taken in a later step if rods insert below the RIL.

D. Correct.

Technical Reference(s): 2OM-53.C.4.2.1.3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-53C.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must assess conditions and determine appropriate course of action.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	004 G2.1.27	
	Importance Rating	2.8	

Conduct of Operations: Knowledge of system purpose and/or function.

Question: RO 77

Concerning the Chemical and Volume Control System, which ONE of the following describes a function of excess letdown?

A. Provides additional letdown capability, maintaining programmed water level in the RCS during load changes.

B. Provides additional letdown capability, when normal letdown is out of service to allow for continued RCP seal injection flow.

C. Provides heat sink on the tube side of the non-regenerative heat exchanger during periods of high letdown flow requirements.

D. Provides heat sink on the shell side of the regenerative heat exchanger during periods of high charging flow.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. PRZR accommodates surges in RCS volume during load changes.

B. Correct.

C. Incorrect. Flows through the tube side of the excess letdown heat exchanger. Normal letdown is cooled on the tube side of the RHX.

D. Incorrect. Flows through the tube side of the excess letdown heat exchanger. Normal letdown provides heat sink on the shell side of the RHX.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-7.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-7.1 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	040 AA2.05	
	Importance Rating		4.5

Question: SRO 77

Given the following conditions:

- A Main Steam Line Break has occurred.
- The reactor has tripped. All equipment operates as designed.
- The following signals have actuated:
  - SI
  - CIA
  - CIB
  - MSLI
- The crew has entered E-2, Faulted Steam Generator Isolation due to the depressurization of 21A SG.
- RCS pressure is 1900 psig and rising.
- Pressurizer level is 48% and rising.

Which ONE of the following describes the procedure that will be used to reset safety injection and stop the ECCS pumps?

A. E-2, Faulted SG Isolation

B. E-1, Loss Of Reactor Or Secondary Coolant

C. ES-1.1, SI Termination

D. ES-1.2, Post LOCA Cooldown And Depressurization

Proposed Answer: C

Explanation (Optional):

A. Incorrect. No provision in E-2 for reset of SI.

B. Incorrect. Transition is to ES-1.1 after completing E-2.

C. Correct.

D. Incorrect. ES-1.2 is not entered on a MSLB.

Technical Reference(s): 2OM-53A.1.E-2 (Attach if not previously provided)
2OM-53A.1.ES-1.1

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:

10CFR55.43(b) item 5 because the SRO must determine the appropriate procedure for the conditions presented.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	013 A4.02	
	Importance Rating	4.3	

Ability to manually operate and / or monitor in the control room: Reset of ESFAS channels.

Question: RO 78

Following a Reactor Trip and Safety Injection, ES-1.1, SI Termination is being performed. Both trains of safety injection have been RESET.

Which ONE of the following describes the plant response if a subsequent Safety Injection Signal is received?

A. If the reactor trip breakers are open, all automatic safety injection signals will be blocked.

B. If the reactor trip breakers are closed, all automatic safety injection signals will be blocked.

C. If the reactor trip breakers are closed, all automatic safety injection signals can be manually blocked.

D. If the reactor trip breakers are open, all automatic safety injection signals, except high containment pressure, will be blocked.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Reactor trip breaker closing enables automatic SI.

C. Incorrect. High containment pressure SI cannot be manually blocked.

D. Incorrect. High containment pressure is blocked.

Technical Reference(s): 2OM-53A.1.ES-1.1 (Attach if not previously provided)
2OM-11.2.A

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-11.1 Objective 5 (As available)

Question Source: Bank # 2SQS-11.1-13
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	069 AA2.02	
	Importance Rating		4.4

Ability to determine and interpret the following as they apply to the Loss of Containment Integrity: Verification of automatic and manual means of restoring integrity.

Question: SRO 78

Given the following conditions:

- A LOCA has occurred.
- Conditions are met for initiation of Safety Injection and Quench Spray.
- All components are operating as required EXCEPT for the following:
  - All indicating lights with BLUE marks are NOT lit.

Which ONE of the following actuations must be **MANUALLY** initiated?

A. SI

B. CIA

C. CIB

D. MSLI

Proposed Answer: C

Explanation (Optional):

A. Incorrect. SI components are identified with red lights.

B. Incorrect. CIA components are identified with orange lights.

C. Correct.

D. Incorrect. MSLI components are identified with yellow lights.

Technical Reference(s): 2OM-53A.1.A-0.11 (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 5 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis Comprehension

10 CFR Part 55 Content: 55.41 X

55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	022 A3.01	
	Importance Rating	4.1	

Ability to monitor automatic operation of the CCS, including: Initiation of safeguards mode of operation.

Question: RO 79

Given the following conditions:

- A loss of offsite power has occurred.
- All equipment has started and is operating as designed.

Which ONE of the following describes how Containment temperature is controlled under these conditions?

A. All containment air recirculation fans automatically sequence onto the EDGs.

B. Containment air recirculation fans automatically start when their control switches are placed in 'AUTO AFTER STOP'.

C. Containment air recirculation fans must be manually started as necessary to control Containment temperature.

D. Containment air recirculation fans "A" and "B" automatically sequence onto the EDGs. Fan "C" must be manually started on the bus it is aligned to.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Do not sequence onto the EDG's on a loss of power.

B. Incorrect. No automatic operation available to start fans.

C. Correct.

D. Incorrect. Fan "C" is a swing fan for either bus. None of the fans automatically start, but

2LOT4 NRC Written Exam

"C" will start in manual.

Technical Reference(s): 2OM-44.C.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2OM-44.C.1 Objective 13 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E07EA2.2	
	Importance Rating		3.9

Ability to determine and interpret the following as they apply to the (Saturated Core Cooling): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Question: SRO 79

This is an open reference question.

Given the following conditions:

- A Steam Generator Tube Rupture has occurred.
- Due to a subsequent steam break and additional component failures, the crew is performing the actions contained in ECA-3.2, SGTR With Loss of Reactor Coolant - Saturated Recovery Desired.
- A YELLOW path on the Core Cooling CSF Status Tree exists due to a loss of RCS subcooling.

Which ONE of the following actions is required for this condition?

A. Enter FR-C.3, Response To Saturated Core Cooling and perform the actions to re-establish RCS subcooling.

B. The crew may perform the actions of FR-C.3 at the STA's discretion to re-establish RCS subcooling.

C. Continue performing the actions of ECA-3.2 and do not perform any action contained in FR-C.3.

D. Continue performing the actions of ECA-3.2 and perform only the actions of FR-C.3 that do not conflict with ECA-3.2.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. FR-C.3 is not performed if ECA-3.2 is in effect.

B. Incorrect. FR-C.3 is not performed if ECA-3.2 is in effect.

C. Correct.

D. Incorrect. FR-C.3 is not performed if ECA-3.2 is in effect.

Technical Reference(s): 2OM-53A.1.FR-C.3, Entry Note (Attach if not previously provided)

Proposed References to be provided to applicants during examination: ECA-3.2, FR-C.3

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 2 because the SRO must assess conditions and determine appropriate procedural direction.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	056 A2.04	
	Importance Rating	2.6	

Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of condensate pumps.

Question: RO 80

Given the following conditions:

- The Unit is operating at 92% power with all systems in NSA.
- [2CNM-P21B], Condensate Pump trips on overcurrent.
- All systems operate as designed.

Which ONE of the following actions is required?

A. Reduce reactor power to less than 80% to prevent a reactor trip on low SG water level.

B. Manually start the standby condensate pump immediately to prevent a reactor trip on low SG water level.

C. Verify the automatic start of the standby condensate pump and verify that SG levels are controlling in the normal range.

D. Trip the reactor and enter E-0, Reactor Trip Or Safety Injection due to the loss of main feed pump suction.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. A power reduction is not required if all systems operate as designed.

B. Incorrect. The standby pump starts automatically.

C. Correct.

D. Incorrect. Reactor trip is not required if the standby pump operates as designed.

Technical Reference(s): 2OM-22A.4.AAC (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-22.A.1 Objective 2 (As available)

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

Question History: 2001 BVPS-2 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	068 AA2.05	
	Importance Rating		4.1

Ability to determine and interpret the following as they apply to loss of instrument air: When to commence plant shutdown if Instrument Air pressure is decreasing.

Question: SRO 80

Given the following conditions:

- A loss of station instrument air has occurred.
- Instrument air pressure is 50 psig and trending DOWN.

In accordance with AOP-2.34.1, Loss Of Station Instrument Air, which ONE of the following actions is required **NEXT**?

A. Start [2SAS-C22] Condensate Polishing Air Compressor, and manually open [2SAS-AOV105] Station Air To Service Air Isolation Valve.

B. Realign charging and letdown to allow Pressurizer level control.

C. Manually trip the turbine and establish AFW flow from the TDAFW pump in accordance with AOP-2.26.1, Turbine And Generator Trip.

D. Manually trip the reactor, enter E-0, Reactor Trip Or Safety Injection and continue referring to the guidance in AOP-2.34.1.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. AOV-105 cannot be opened manually with SA pressure <70 psig.

B. Incorrect. Action performed if IAS pressure is less than 30 psig.

C. Incorrect. No direction in procedure to trip the turbine only, MFRV's and condenser steam dumps fail closed.

D. Correct. MFRV's fail closed.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-53C.4.2.34.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-53C.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55,43(b) item 5 because the SRO must assess plant conditions and determine the correct course of action.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	059 A4.01	
	Importance Rating	3.1	

Ability to manually operate and monitor in the control room: MFW turbine trip indication.

Question: RO 81

The Unit is operating at 90% power with all systems in NSA.

Which ONE of the following indicates a trip of [2FWS-P21A], MFW Pump?

A. 2FWS-P21A white indicating lamp is ON. Recirculation valve 2FWR-FCV150A is closed.

B. 2FWS-P21A white indicating lamp is ON. Recirculation valve 2FWR-FCV150A is open.

C. 2FWS-P21A white indicating lamp is OFF. Recirculation valve 2FWR-FCV150A is closed.

D. 2FWS-P21A white indicating lamp is OFF. Recirculation valve 2FWR-FCV150A is open.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. 2FWR-FCV150A remains closed as long as one MFW pump is running and feed pump suction flow is greater than 8,000 gpm.

C. Incorrect. White indicating lamp is lit for a feed pump trip.

D. Incorrect. White indicating lamp is lit for a feed pump trip.

Technical Reference(s): 2OM-24.1.D (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-24.1 Objective 13 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	001 A2.03	
	Importance Rating		4.2

Ability to (a) predict the impacts of the following malfunctions or operations on the CRDS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Effect of stuck or misaligned rod

Question: SRO 81

Given the following:

- Reactor power has been stabilized at 91% during a power ascension because one control bank 'D' rod has been determined to be misaligned from its group step counter by 20 steps.
- The affected control rod has been determined to be immovable but still trippable.

In addition to FQ(Z) and FNΔH, which of the following additional core parameters need to be evaluated to ensure that they are within allowable limits, and which procedure must be utilized to correct the problem?

A. Only AFD must also be evaluated and AOP-2.1.7, Rod Position Indication Malfunction, must be utilized.

B. Only QPTR must also be evaluated and AOP-2.1.8, Rod Inoperability, must be utilized.

C. QPTR, and AFD must also be evaluated and AOP-2.1.7, Rod Position Indication Malfunction, must be utilized.

D. QPTR, and AFD must also be evaluated and AOP-2.1.8, Rod Inoperability, must be utilized.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Must also evaluate QPTR and wrong procedure.

B. Incorrect. Must also evaluate AFD.

C. Incorrect. Wrong procedure.

D. Correct.

Technical Reference(s): 2OM-53AC.4.2.1.8 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-53C.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments: 10CFR55.43(b) item 2 because the SRO must determine action IAW Technical Specifications. This requires knowledge of the applicable LCO.
Replaced question due to duplicate of #41.

Record Type #A9 350C

Beaver Valley Power Station

UNIT 2

FOR TRAINING USE ONLY

2OM-53C.4.2.10.1

Residual Heat Removal System Loss

Revision 6

Prepared by M. P. Flynn	Date 02/20/02	Pages Issued 1 through 20	
Reviewed by C. Eberle	Date 02/20/02	Validated by N/A	Date
OSC Meeting No. OSC Not Required	Date	DRR-01-04568	

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

A. PURPOSE

Provides instructions to restore RHS when the RCS is NOT in a REDUCED INVENTORY/MIDLOOP condition.

B. SYMPTOMS OR ENTRY CONDITIONS

1. Annunciator A1-5H, "RESIDUAL HEAT REMOVAL SYSTEM TROUBLE" - LIT
2. Low RHR Flow indicated on [2RHS*FI606A(B)], RHR Flow Train A(B).
3. Loss or reduced temperature differential across residual heat exchangers on [2RHS*TR604A(B)], RHR Hx Diff Temp.
4. Rising reactor coolant temperature.
5. Indication by pump ON-OFF lights.
6. Air binding of the operating RHR pumps as indicated by any of the following:
   - Motor current oscillations
   - Erratic flow oscillations
   - Excessive pump noise
   - Pump cavitation

C. AUTOMATIC ACTIONS

None

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

****

CAUTION

Investigate cause of loss of running RHR pump prior to attempting start of idle pump. This will prevent loss of two RHR pumps due to common condition.

****

NOTE

Depending upon RCS temperature and generation rate of residual heat, normally fifteen (15) minutes or more would be available before an alternate method of cooling is required.

1. Alert Plant Personnel Of The Loss Of RHS

   a. Sound standby alarm.

   b. Announce the Unit 2 loss of Residual Heat Removal System.

   c. Evaluate if EPP should be initiated.

   d. Periodically monitor containment radiation conditions on RM-11 for the following monitors:

      1) [2RMR*RQ303A,B], CNMT Airb (1021,2021).

      2) [2RMR-RQ203], M-Crane Area (1025).

      3) [2HVR*RQ104A,B], CNMT Purge (1024,1028).

   e. Evacuate personnel from containment when the NSS determines that the containment environment condition has degraded to the point that personal safety may be jeopardized.

(step continued next page)

Number	Title	Revision
2.10.1	Residual Heat Removal System Loss	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	(continued from previous page)	
	f. Contact Security to perform personnel accountability for containment.	
2.	Identify And Isolate Any RCS, RHS Or CVCS Leakage	
3.	Check RCS Level - STABLE	Terminate any RCS draining evolution.
4.	Suspend All Dilution Operations Of The RCS	
5.	Check RHR Pump Status	
	a. Check RHR Pump - AT LEAST ONE RUNNING	a. IF the inservice RHR Pump has tripped due to the loss of an emergency bus, motor fault or electrical failure, THEN GO TO Step 14. IF pump tripped for any other reason, THEN perform the following: 1) Dispatch an operator to perform Attachment 5, "Venting RHR Pump". 2) GO TO Step 11.
	b. Log RHR Pump amps every 10 minutes until degraded condition is terminated.	

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	Check RHR Pump For Cavitation • Flow - STABLE • Amps - STABLE	IF RHR Pump flow or amps are erratic, THEN adjust flow as required to maintain RHR flow greater than 1500 GPM AND pump amps stable. IF stable conditions can NOT be established, THEN perform the following: a. Trip operating pump. b. Dispatch an operator to perform Attachment 5, "Venting RHR Pump". c. GO TO Step 11.
7.	Dispatch An Operator To Perform Attachment 5, "Venting RHR Pump"	
8.	Print Full Thermocouple Map, Or Log At Least Two Thermocouples Per Core Quadrant • Refer to 20M-5A.4.A.59, "Thermocouple Long Form Map" or 20M-5A.4.A.60, "Thermocouple Short Form Map" • Perform every 10 minutes until degraded condition is terminated • Monitor core subcooling until degraded condition is terminated	

Number	Title	Revision
2.10.1	Residual Heat Removal System Loss	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	Verify Component Cooling Water Operation	
	a. [2CCP*P21A(B)(C)], CCP Pumps - AT LEAST ONE RUNNING	a. Start standby CCP pump.
	b. Check the following: • [2CCP-MOV150-1,2(151-1,2)], Pri Comp Clg Wtr Pps Supply Hdr A(B) Isol Vlvs - OPEN • [2CCP*MOV112A(B)], RHR Pp Seal Clr 22A(B) & Hx 21A(B) Cooling Water Inlet Vlv(s) - OPEN • [2CCP*MOV156-1,2(157-1,2)], Pri Comp Clg Wtr Pps Return Hdr A(B) Isol - OPEN • [2CCP-FI117A1,A2(117B1,B2)], Pri Comp Clg Flow - FLOW INDICATED	b. Align valves as necessary.
	c. [2CCP-TI100A(B)(C)], CCP Hx Disch Temp - NORMAL RANGE	c. Monitor RHS fluid temperature. IF RHS temperature is greater than 180F, THEN stop RHR pumps to prevent damage to mechanical seals.
10.	Check All RHS Valves • [2RHS*MOV701A(B)] RHS Train A(B) Supply Isol Vlv - OPEN • [2RHS*MOV702A(B)] RHS Train A(B) Supply Isol Vlv - OPEN • [2RHS*MOV720A(B)] 21A(B) RHR Hx Return Isol Vlv - OPEN	Align valves as required.

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11.	Estimate Time To RCS Saturation	
	a. Check RHR Pumps - NONE RUNNING	a. GO TO Step 12.
	b. Perform Attachment 4 or request STA to calculate time to saturation using computer program while continuing with this procedure.	

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- If no RHR Pumps are running, the time to saturation in the RCS (Attachment 4 or calculated by STA using computer program) should be taken into consideration when determining how much time should be spent venting the RHS prior to taking additional actions for alternate cooling sources.
- If adequate time to completely vent the RHS is not available (without RHR Pumps running), air can be swept out of the RHS lines by running an RHR Pump at a flowrate greater than 2500 GPM and less than 3000 GPM.

12. Determine If RHS Should Be Vented

a. Check if voids have been induced into the RHS as indicated by previous erratic pump flow or pump motor amps.	a. GO TO Step 12.d.
b. Maintain RCS level while venting RHR system.	
c. Continue to vent RHR Pump in accordance with Attachment 5.	
d. Check RHR Pump - ONE RUNNING	d. GO TO Step 13.
e. Verify following parameters: • Pump Amps - STEADY • Pump Flow - GREATER THAN 1500 GPM • CCP Temperature - NORMAL • CCP Pumps - AT LEAST ONE RUNNING • CCP Valves - ALIGNED TO RHR LOOP	e. Adjust flow to establish RHS flow greater than 1500 GPM AND pump amps stable. IF stable conditions can NOT be established, THEN trip operating pump AND RETURN TO Step 2.
f. GO TO 20M-10.4.B, "Residual Heat Removal System Running".	

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13.	<u>Close All Containment Penetrations Providing Access To The Outside Atmosphere:</u>	
	a. Contact the containment controller and request the following:	
	1) Close the equipment hatch.	
	2) Close one door of the Personnel Airlock.	
	3) Dispatch an operator to verify containment integrity with respect to the equipment hatch. Refer to 20ST-47.3, "Containment Integrity Checklist For Refueling".	
	b. Contact personnel controlling open containment penetration(s) to atmosphere (i.e., Type "C")	
	1) Request that the penetration(s) be closed.	
14.	<u>Establish Conditions To Support RHS Operation</u>	
	a. Check RHS valves - OPEN • [2RHS*MOV701A(B)], RHS Train A(B) Supply Isol Vlv • [2RHS*MOV702A(B)], RHS Train A(B) Supply Isol Vlv • [2RHS*MOV720A(B)], 21A(B) RHR Hx Return Isol Vlv	a. Manually align valves.

(step continued next page)

Number	Title	Revision
2.10.1	Residual Heat Removal System Loss	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	(continued from previous page)	
	b. Verify CCP cooling to RHS - AVAILABLE • [2CCP-MOV150-1,2(151-1,2)], Pri Comp Clg Wtr Pps Supply Hdr A(B) Isol Vlvs - OPEN • [2CCP*MOV112A(B)], RHR Pp Seal Clr 22A(B) & Hx 21A(B) Cooling Water Inlet Vlv(s) - OPEN • [2CCP*MOV156-1,2(157-1,2)], Pri Comp Clg Wtr Pps Return Hdr A(B) Isol - OPEN • [2CCP-FI117A1,A2(117B1,B2)], Pri Comp Clg Flow - FLOW INDICATED	b. Restore CCP Cooling.

****

CAUTION

Starting an RHR Pump may result in an RCS level drop due to shrink or void collapse.

****

15.	Restore RHS Flow	
	a. Close RHR discharge flow path throttle valves: • [2RHS*HCV758A(B)], 21A(B) RHR Hx Flow Control Vlv • [2RHS*FCV605A(B)], 21A(B) Hx Bypass Vlv	a. Close [2RHS*MOV720A(B)], RHS Train A(B) Return Isol Vlv AND throttle valve electrically or manually to control flow after pump start.

(step continued next page)

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15.	(continued from previous page)	
	b. Check if RHR Pump to be started has been vented, if required.	b. Determine time to saturation using Attachment 4 or request STA to calculate using computer program. At the discretion of the NSS/ANSS, perform any of the following: • Continue venting the RHS. RETURN TO Step 12 -OR- • Start an RHR Pump at a flow greater than 2500 GPM and less than 3000 GPM. GO TO Step 15.d -OR- • Establish alternate RCS cooling. GO TO Step 16
	c. Start one RHR Pump.	c. <u>IF</u> pump was vented, <u>THEN</u> GO TO Step 16. <u>IF</u> <u>NOT</u>, <u>THEN</u> perform the following: 1) Dispatch an operator to perform Attachment 5, "Venting RHR Pump". 2) RETURN TO Step 11.
	d. Maintain RCS level.	
	e. Gradually raise RHS heat exchanger bypass flow to desired flowrate using [2RHS*FCV605A(B)], 21A(B) RHR Hx Bypass Vlv.	
	f. RHS flow - RESTORED	f. GO TO Step 16.

(step continued next page)

Number	Title	Revision
2.10.1	Residual Heat Removal System Loss	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15.	(continued from previous page)	
	g. Using [2RHS*HCV758A(B)], 21A(B) RHR Hx Flow Control Vlv, establish RCS cooldown rate - LESS THAN 50F/HR	
	h. Verify following parameters: • Pump Amps - STEADY • Pump Flow - GREATER THAN 1500 GPM • CCP Temperature - NORMAL • CCP Pumps - AT LEAST ONE RUNNING • CCP Valves - ALIGNED TO RHR LOOP	h. Adjust flow to establish RHS flow greater than 1500 GPM <u>AND</u> pump amps stable. <u>IF</u> stable conditions can <u>NOT</u> be established, <u>THEN</u> trip operating pump <u>AND</u> RETURN TO Step 2.
	i. GO TO 20M-10.4.B, "Residual Heat Removal System Running".	
16.	<u>Attempt To Provide Alternate Core Cooling</u>	
	a. Check if plant is in Mode 6.	a. GO TO Step 17.
	b. <u>IF</u> Reactor Cavity can be flooded, <u>THEN</u> refer to 20M-11.4.C, "Filling Reactor Refueling Cavity".	b. GO TO Step 17.
	c. <u>IF</u> Reactor Cavity is flooded, <u>THEN</u> refer to 20M-20.4.A, "Fuel Pool Cooling/Purification System Startup And Operation", to raise pool cooling.	
	d. Refer to Tech Spec 3.9.8.1.	
	e. Check RCS temperature - LESS THAN 140F	e. Continue cooling the RCS.
	f. Continue attempts to restore RHS cooling.	
	g. RETURN TO Step 15.	

Number	Title	Revision
2.10.1	Residual Heat Removal System Loss	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

****

CAUTION

- If all Reactor Coolant Pumps have been idle for more than 5 minutes and reactor coolant temperature is greater than charging and seal injection water temperature, do not start first RCP until steam bubble has been formed in pressurizer.
- Do not repressurize RCS if any flux thimble low pressure seals are installed. This may cause flux thimble seal failure and result in loss of RCS inventory.

****

17. Repressurize Or Makeup To the RCS

a. Check if RCS is intact.	a. Makeup to the RCS at 2-3 times the boiloff rate (Attachment 3) to remove decay heat and raise RCS level using any of the following: • Available boration flowpath • 20M-6.4.J, "RCS Makeup From RWST" WHEN RCS is restored to desired level, THEN adjust makeup to maintain RCS level. Continue attempts to restore RHS cooling. RETURN TO Step 15.

(step continued next page)

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17.	(continued from previous page)	
	b. Check RCS loop - AT LEAST ONE AVAILABLE WITH SG CAPABLE OF REMOVING HEAT	b. Start RCS feed and bleed operation by performing the following: 1) Operate one Charging/HHSI Pump through a cold leg injection flowpath. 2) Open a PRZR PORV and its associated motor operated isolation valve. Continue attempts to restore RHS cooling. RETURN TO Step 15.
	c. Check OPPS is in service.	
	d. Repressurize RCS until RCP Seal Delta-P is greater than 212 PSID.	
	e. Attempt to start Reactor Coolant Pump. 1) Refer to 20M-6.4.A, "Reactor Coolant Pump Startup".	e. Start RCS feed and bleed operation by performing the following: 1) Operate one Charging/HHSI Pump through a cold leg injection flowpath. 2) Open a PRZR PORV and its associated motor operated isolation valve. Continue attempts to restore RHS cooling. RETURN TO Step 15.
18.	<u>Initiate Heat Removal From Steam Generator By Discharging Steam</u> • Refer to 20M-51.4.K, "Station Shutdown - Cooldown To Mode 5 With Residual Heat Removal System Inoperable"	

Number	Title	Revision
2.10.1	Residual Heat Removal System Loss	6

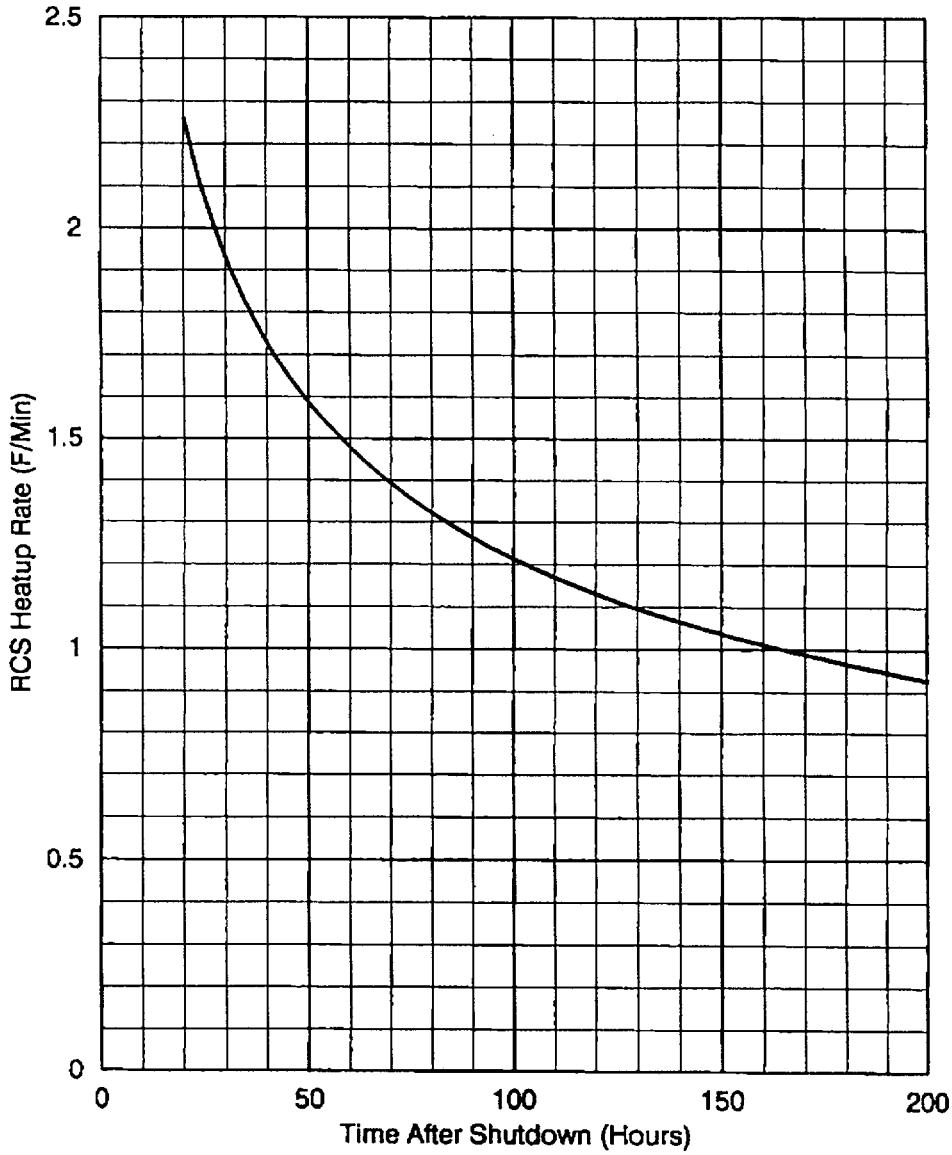
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	Restore RHS Cooling	
	a. Continue attempts to restore RHS cooling.	
	b. RETURN TO Step 15.	

- END -

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

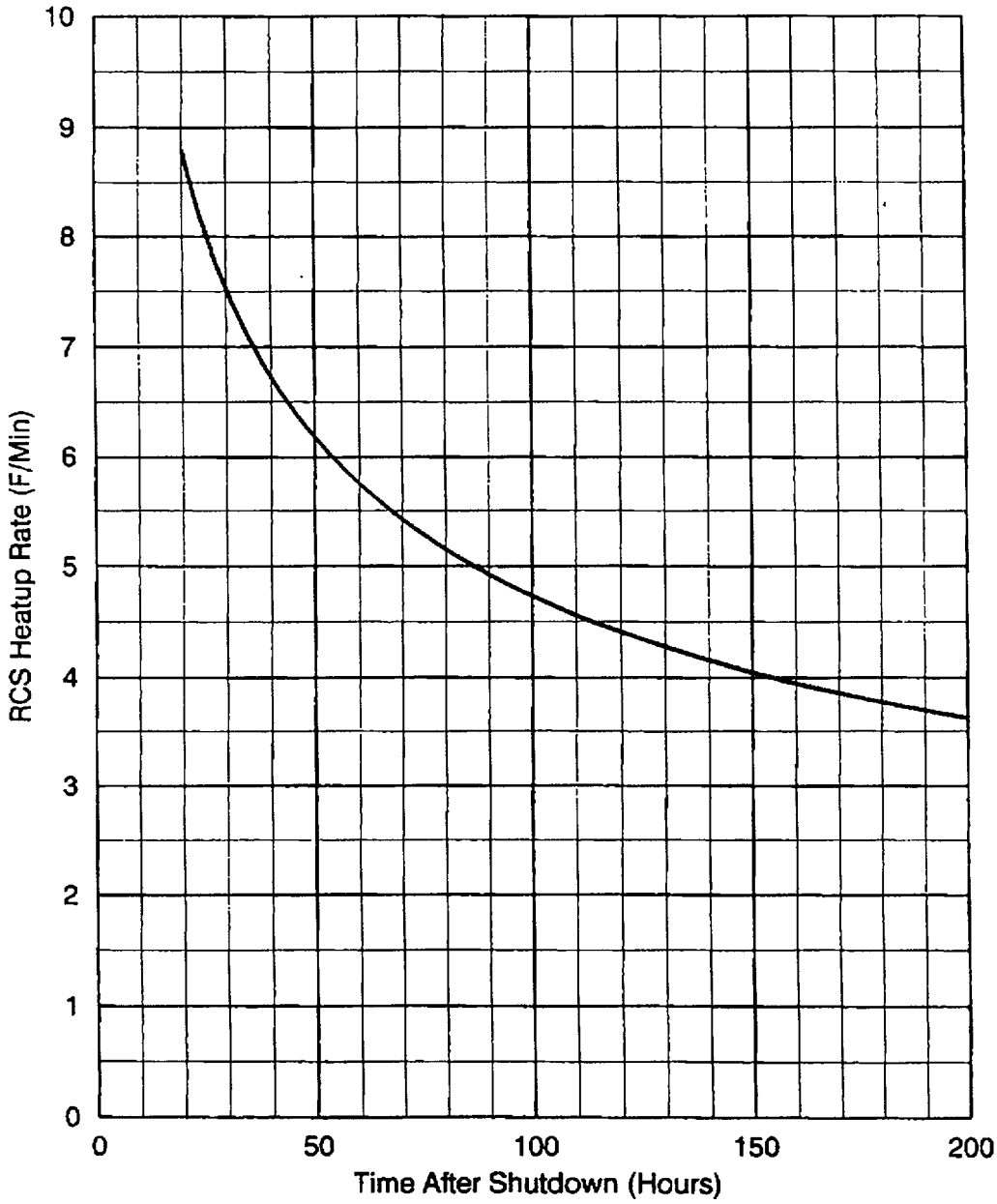
Attachment 1

RCS Heatup Rate With RCS Intact
And Initial PRZR Level At 22%



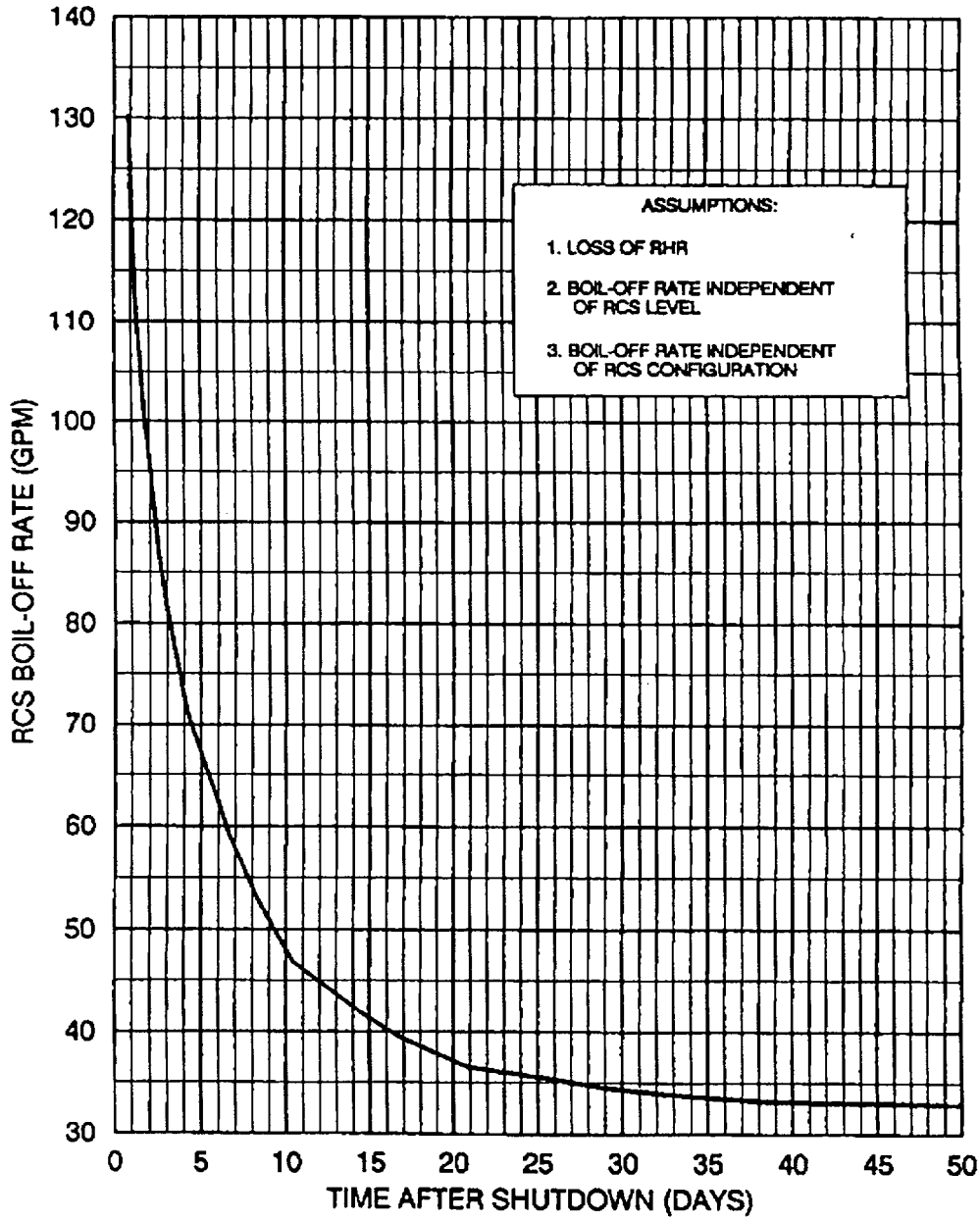
Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

Attachment 2
RCS Heatup Rate With RCS Level One Foot Below
Flange And All Three Loops Isolated



Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

Attachment 3
BOIL-OFF RATE



Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

Attachment 4

WORKSHEET TO ESTIMATE TIME TO SATURATION

1. Record saturation temperature corresponding with present RCS pressure.

   _____F

2. Record present RCS temperature.

   _____F

3. Determine RCS heatup rate using Attachment 1 or 2.

   _____F/Min

4. Estimate time to saturation as follows:

$$\text{Time to saturation} = \frac{\text{(RCS saturation temp - RCS temp)}}{\text{Heatup rate}}$$

$$\text{Time to saturation} = \frac{_____\ \text{F (Step 1)} - _____\ \text{F (Step 2)}}{_____\ \text{F/Min (Step 3)}}$$

Time to saturation = _____Minutes

-END-

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

Attachment 5

VENTING RHR PUMP

1. IF [2RHS*P21A] RHR Pump is to be vented, THEN perform the following:

   a. Open [2RHS*307] RHS Train A PP Seal Cooler Vent until a solid stream of water exists (CNMT - 718', RHS Platform).

   b. Close [2RHS*307].

2. IF [2RHS*P21B] RHR Pump is to be vented, THEN perform the following:

   a. Open [2RHS*308] RHS Train B PP Seal Cooler Vent until a solid stream of water exists (CNMT - 718', RHS Platform).

   b. Close [2RHS*308].

-END-

Number	Title	
2.10.1	Residual Heat Removal System Loss	Revision 6

REFERENCES

NOTE: All references used prior to February 25, 1986, are located in Section 5.

1. Issue 1, Revision 2: OMDR 2-87-0260.
2. Issue 1, Revision 4: OMDR 2-87-1422.
3. Issue 1, Revision 11: OMDR 2-88-1677.
4. Issue 1, Revision 12: OMDR 2-88-1975; NRC Generic Letter 88-17, "Midloop Operation".
5. Issue 1, Revision 13: OMCN 2-89-105.
6. Issue 1A, Revision 0: OMDR 2-90-0658.
7. Issue 1A, Revision 1: OMDR 2-90-0819, 1124, 1125; 2-91-0783, 0784, 1686, 1687; 2-93-0623; Walkthrough Validation Comment (9/14/92); Table-Top Validation Comment (6/25/93); OSC Subcommittee Comment (6/30/93).
8. Issue 1A, Revision 2: OMDR 2-94-0312; Simulator Validation Comment (12/5/94); OSC Subcommittee Comment (12/14/94).
9. Issue 1A, Revision 3: OMCR 2-96-0100, 0229; EM 111791; INPO Suggested Enhancements.
10. Issue 1A, Revision 4: OMCR 2-96-0674.
11. Issue 1A, Revision 5: CR 992909-03, Added option that STA may calculate Time To Boiling using computer program.
12. Revision 6: DRR-01-04568, modified instruction No. 13, "Containment Integrity", to recognize that the containment controller may be responsible for equipment hatch closure. Added substep 1.f, "Security to perform accountability". Corrected procedure number for 20M-11.4.C.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	061 K4.03	
	Importance Rating	2.7	

Knowledge of AFW design feature(s) and/or interlock(s), which provide for the following: automatic blowdown/sample isolation.

Question: RO 82

Given the following:

- The Unit is operating at 100% power with all systems in NSA.
- A circuit failure causes [2FWE*P23A], Auxiliary Feedwater Pump to automatically start.
- The plant continues to operate at power.

Which ONE of the following describes the effect on SG blowdown?

A. One SG blowdown isolation valve closes on one SG.

B. Both SG blowdown isolation valves close on one SG.

C. One SG blowdown isolation valve closes on all SGs.

D. Both SG blowdown isolation valves close on all SGs.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. SG blowdown inside containment isolation valves shut if 2FWE*23B is running.

B. Incorrect. SG blowdown inside containment isolation valves shut if 2FWE*23B is running.

C. Correct.

D. Incorrect. SG blowdown outside containment isolation valves shut when 2FWE*23A is running.

Technical Reference(s): 2OM-25.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-25.1 Objective 7 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	061 G2.2.25	
	Importance Rating		3.7

Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Question: SRO 82

With the Unit in Mode 1, which ONE of the following Auxiliary Feedwater component failures is the most restrictive with respect to Technical Specification 3.7.1.2 and the Bases requirements?

A. One MDAFW pump inoperable

B. TDAFW pump inoperable

C. One feedwater injection header inoperable

D. [TK-210], PPDWST below minimum required level

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Design function of 2 pumps is still met.

B. Incorrect. Design function of 2 pumps is still met.

C. Correct. Bases assumes one feed line breaks. With another injection line inoperable, only 1 SG is available for heat sink making this condition beyond the design basis.

D. Incorrect. Service water is available as a backup.

Technical Reference(s): TS 3.7.1.2 and Bases (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

2LOT4 NRC Written Exam

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 1 and 2 because the SRO must know the design basis of safety related systems and the TS requirements for their operability.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	068 K6.10	
	Importance Rating	2.5	

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

Question: RO 83

Given the following:

- The Unit is operating at 100% power with all systems in NSA.
- Discharge of [2SGC-TK23A], Steam Generator Blowdown Test Tank is in progress.
- [A4-5A], RADIATION SYSTEM MONITORING TROUBLE annunciator alarms.
- RM-11 indicates [2SGC-RQI100], Liquid Radwaste Effluent Monitor has lost sample flow.

Which ONE of the following describes the impact on the Liquid Radwaste System?

A. The discharge will automatically terminate immediately.

B. The discharge will continue unless manually terminated.

C. The discharge will automatically terminate after a short time delay.

D. [2SGC-P26A], Blowdown Test Tank Pump will start re-establishing sample flow.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Discharge must be manually terminated.

B. Correct.

C. Incorrect. Discharge must be manually terminated.

D. Incorrect. One blowdown test tank pump will be running to support the discharge.

Technical Reference(s): 2OM-43.4.ACC (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2OM-43.1 Objective 7 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	063 G2.1.33	
	Importance Rating		4.0

Conduct of Operations: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Question: SRO 83

This is an open reference question.

Given the following conditions:

- The plant is operating at 100% power. All systems are in NSA.
- Maintenance reports that a common mode equipment failure has resulted in the inoperability of both ORANGE train and both PURPLE train battery banks.

Which ONE of the following actions is required?

A. Enter T.S. 3.0.3. As soon as 3 of the 4 battery banks are restored to operability, T.S. 3.0.3 may be exited.

B. Enter T.S. 3.0.3. As soon as one train of battery banks is restored to operability, T.S. 3.0.3 may be exited.

C. Enter T.S. 3.8.2.3. Restore at least one train of battery banks to operable status within 2 hours or be in Hot Standby within the next 6 hours.

D. Enter T.S. 3.8.2.3. Restore 3 of the 4 battery banks to operable status within 2 hours or be in Hot Standby within the next 6 hours.

Proposed Answer: A

Explanation (Optional):

A. Correct. T.S. 3.0.3 is required if only 1 bus is operable.

B. Incorrect. With one train restored, 2 battery banks may still be inoperable.

C. Incorrect. T.S. 3.8.2.3 does not provide actions for the failure, must enter 3.0.3.

D. Incorrect. T.S. 3.8.2.3 does not provide actions for the failure, must enter 3.0.3.

Technical Reference(s): T.S. 3.0.3 (Attach if not previously provided)
T.S. 3.8.2.3

Proposed References to be provided to applicants during examination: TS 3.8.2.3

Learning Objective: _____ (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis Application

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 2 because the SRO must understand operability and action requirements for plant systems.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	001 K4.07	
	Importance Rating	3.7	

Knowledge of CRDS design features and/or interlocks providing for the following: Rod Stops.

Question: RO 84

Which ONE of the following describes the operation of the Intermediate Range High Flux Level Rod Stop?

Blocks rod withdrawal in MANUAL and...

A. is automatically defeated above P-10.

B. must be manually defeated above P-10.

C. is automatically defeated above P-6.

D. must be manually defeated above P-6.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Not automatically defeated.

B. Correct.

C. Incorrect. Wrong power level, must be manually defeated.

D. Incorrect. Wrong power level.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-1.5.B.2 (Attach if not previously provided)
2OM-1.5.B.3

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3 Objective 21 (As available)

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

Question History: Vendor Bank, Previous NRC

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	068 A2.04	
	Importance Rating		3.3

Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunction or operations: Failure of automatic isolation.

Question: SRO 84

Given the following conditions:

- The Unit is operating at 100% power with all systems in NSA.
- A liquid release of [2SGC-TK23A], Steam Generator Blowdown Test Tank is in progress.
- The following annunciators are received in the Control Room:
  - [A4-5A], Radiation Monitoring System Trouble
  - [A4-5C], Radiation Monitoring Level High
- [2SGC-RQI100], Liquid Waste Process Effluent RM-11 console point is flashing RED.
- The discharge remains in progress.

Which ONE of the following describes effect on the plant and the actions required?

A. The radiation monitor is working properly and the discharge should NOT have isolated. Request that RadCon recheck calculations and provide recommendations on action to be taken.

B. The radiation monitor has failed. The release may continue provided 2 independent samples are taken and the activity is verified to be below ODCM limits.

C. The discharge should have automatically stopped. Stop the discharge, direct Chemistry to sample the test tank and refer to the ODCM for further actions.

D. The discharge should have automatically stopped. Stop the discharge, direct Chemistry to sample the test tank and declare an ALERT based on unauthorized radwaste discharge exceeding 10CFR20 limits.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Alarm level is exceeded requiring the discharge to be stopped

B. Incorrect. This is an ODCM action for a radiation monitor failure, not an alarm condition.

C. Correct.

D. Incorrect. Alert should not be declared and 10CFR100 limits are for accidents.

Technical Reference(s): 2OM-43.4.ACC (Attach if not previously provided)
2OM-43.4.AEE

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-43.1 Objective 7 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) items 2, 4, and 5 because the SRO must know the requirements for radioactive discharge and assess conditions where limits may be exceeded, directing appropriate action.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	071 A4.20	
	Importance Rating	2.5	

Ability to manually operate and/or monitor in the control room: Placing WGDS gas compressors in automatic operation.

Question: RO 85

Given the following:

- The Unit is in Mode 4.
- A plant heatup is in progress.
  - [2GWS-C21A], Overhead Gas Compressor is RUNNING.
  - [2GWS-C21B], Overhead Gas Compressor has been placed in 'AUTO'.

Which ONE of the following will cause [2GWS-C21B], Overhead Gas Compressor to START?

A. Waste Gas Surge Tank low pressure

B. Degassifier gaseous effluent low pressure

C. Waste Gas Surge Tank high pressure

D. Degassifier gaseous effluent high pressure

Proposed Answer: D

Explanation (Optional):

A. Incorrect. WGST pressure does not control compressor.

B. Incorrect. Low pressure stops the compressor.

C. Incorrect. WGST pressure does not control compressor.

D. Correct. Compressor reduces header pressure and discharges to surge tank.

Technical Reference(s): 2OM-19.1D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-19.1 Objective 2 (As available)

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

Question History: Vendor Bank

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

10 CFR Part 55 Content: 55.41 X
55.43 ____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	029 A2.03	
	Importance Rating		3.1

Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Startup operations and the associated required valve lineups.

Question: SRO 85

Given the following conditions:

- The Unit is in Mode 5.
- Containment pressure has been raised to atmospheric pressure in preparation for a Containment purge.
- Welding operations are in progress inside Containment.

In accordance with 2OM-44C.4.A, Containment Air Purge And Exhaust System Startup, which ONE of the following describes the preferred procedural direction for initiation of the containment purge?

With welding in progress...

A. the filtered flow path should not be used. Initiate containment purge through the unfiltered flow path.

B. the unfiltered flow path should not be used. Initiate containment purge through the SLCRS filtered flow path.

C. the filtered and unfiltered flow paths should not be used. Initiate containment purge to Unit 1 Gaseous Waste System.

D. the filtered and unfiltered flow paths should not be used. Initiate containment purge to the Ventilation Vent.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Filtered path not used if welding is in progress.

C. Incorrect. Unfiltered path is available.

D. Incorrect. Unfiltered path is available is available which is the ventilation vent..

Technical Reference(s): 2OM-44C.4.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-44C.1 Objective 12 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 4 and 5 because the SRO must know the appropriate procedural guidance for initiation of a system with radiological consequences.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	061 A3.01	
	Importance Rating	4.2	

Ability to monitor automatic operation of AFW, including: AFW startup and flows.

Question: RO 86

Given the following conditions:

- A reactor trip occurred from 26% power.
- Total AFW flow is approximately 550 gpm.
- [2FWE*P22], Turbine Driven AFW Pump is NOT running and is NOT tripped.
- [2FWE*P23A (B)], Motor Driven AFW Pumps are running.

Which ONE of the following describes the AFW initiation signal?

A. AMSAC

B. SG Lo-Lo levels

C. Safety Injection

D. Main Feedwater Pumps tripped

Proposed Answer: D

Explanation (Optional):

A. Incorrect. AMSAC starts all AFW pumps.

B. Incorrect. SG Lo-Lo levels start all AFW pumps.

C. Incorrect. SI starts all AFW pumps.

D. Correct. Both MFPs tripped starts MDAFW pumps.

Technical Reference(s): 2OM-24.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-24.1 Objective 13 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	062 A2.01	
	Importance Rating		3.9

Ability to (a) predict the impacts of the following malfunctions or operations on the AC Electrical Distribution System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: The types of loads that, if deenergized, would hinder plant operations.

Question: SRO 86

Given the following conditions:

- The Unit is at 76% power.
- [2CHS*P21A], "A" Charging pump is in service.
- A loss of Emergency Bus "2AE" occurred approximately 7 minutes ago.
- The Reactor Operator can NOT start a charging pump.
- CCP flow to the RCP thermal barriers is '0' gpm.

Per AOP-2.36.2, Loss of 4KV Emergency Bus, which ONE of the following actions is required?

A. RCP thermal barrier cooling has been lost and a reactor trip is NOT required. Continue attempts to restore thermal barrier cooling flow.

B. RCP seal injection has been lost and a reactor trip is NOT required. Continue attempts to start a charging pump to restore seal injection flow.

C. RCP seal cooling is lost. Trip the RCPs, trip the reactor and enter ECA-0.0, Loss Of All AC Power.

D. RCP seal cooling is lost. Trip the reactor, trip the RCPs and enter E-0, Reactor Trip Or Safety Injection.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. RCP trip criteria has been met.

B. Incorrect. RCP trip criteria has been met.

C. Incorrect. Reactor trip and then RCP trip is performed. ECA-0.0 not applicable.

D. Correct. Action for concurrent loss of seal injection and thermal barrier flow for greater than 5 minutes.

Technical Reference(s): 2OM-53C.4.2.36.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53C.1 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must assess conditions and determine appropriate course of action.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	002 A1.08	
	Importance Rating	3.7	

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

Question: RO 87

Given the following conditions:

- A reactor trip occurred due to a complete loss of CCP.
- All RCPs are stopped.
- All systems are operating as designed.
- Steam dumps are in the Tavg Mode.

Which ONE of the following describes the expected response of the core exit thermocouples following the trip of the RCPs?

Core exit temperature initially...

A. rises and then drops and stabilizes below the peak value.

B. drops and then rises and stabilizes at the peak value.

C. rises and then stabilizes at the peak value.

D. drops and then stabilizes at the lower value.

Proposed Answer: A

Explanation (Optional):

A. Correct. Core exit temperature initially rises when the RCPs are stopped due to less flow through the core. As natural circulation flow is established, core exit temperature lowers as decay heat load lowers.

B. Incorrect. CETs initially rise following trip of the RCPs.

C. Incorrect. CETs do not stabilize, but drop because of steam dump load and decay heat.

D. Incorrect. CETs do not drop when RCPs are tripped.

Technical Reference(s): Simulator Response (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-3.1 Objective 1 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
		006 G2.1.11	
	Importance Rating		3.8

Conduct of Operations: Knowledge of less than one hour technical specification action statements.

Question: SRO 87

The Unit is in Mode 1 when the results of a Chemistry sample indicates RWST boron concentration is 1944 ppm.

Which ONE of the following Technical Specification actions, if any, is required?

A. Restore to OPERABLE within 1 hour or be in HOT STANDBY in the following 6 hours.

B. Restore to OPERABLE within 6 hours or be in HOT STANDBY in the following 30 hours.

C. Restore to OPERABLE within 72 hours or be in HOT STANDBY in the following 6 hours.

D. The RWST is OPERABLE, no Technical Specification actions are required.

Proposed Answer: A

Explanation (Optional):

A. Correct. If RWST concentration is not between 2000 and 2100 ppm, then T.S. 3.1.2.8 allows 1 hour to restore or be in Hot Standby within 6 hours.

B. Incorrect. See above.

C. Incorrect. See above.

D. Incorrect. See above.

Technical Reference(s): T.S. 3.1.2.8 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-11.1 Objective 21 (As available)

2LOT4 NRC Written Exam

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

Question History:

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

10 CFR Part 55 Content:	55.41	
	55.43	X

Comments:

10CFR55.43(b) item 2 because the SRO must know the requirements for entry to T.S. actions. In this case, one hour or less.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	011 A2.03	
	Importance Rating	3.8	

Ability to (a) predict the impacts of the following malfunctions or operations on the PZR LCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of Loss of PZR level.

Question: RO 88

The Unit is operating at 100% power, with all systems in NSA, except for [2CHS*FCV122], Charging Flow Control Valve which is in MANUAL, when the following indications are observed;

- Control Bank "D" rod F-6 position indicates '0' steps.
- [A4-9F], ROD AT BOTTOM alarm is received.
- Control rod F-6 is the ONLY rod bottom light lit.
- [A4-1C], PRESSURIZER CONTROL LEVEL DEVIATION HIGH/LOW is in alarm.
- The plant remains on-line.
- PRZR pressure has stabilized at 2000 psig.

Assuming no operator action was taken, which ONE of the following describes the response of PRZR level and the required operator action?

PRZR level is...

A. below 14% and requires an immediate reactor trip.

B. below program and letdown flow must be manually isolated.

C. above program and charging flow must be manually lowered.

D. above program and seal injection flow must be manually raised.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Level deviation alarm occurs at ± 5%. A reactor trip is required only if letdown fails to automatically isolate at 14%.

B. Incorrect. Level is above program.

C. Correct. With net charging initially at zero, charging flow is ~ 90 gpm and letdown is ~105 gpm. When RCS pressure drops due to the dropped rod/reduction in Tavg, charging flow increases and letdown flow decreases. Program level drops with Tavg but net charging is now positive (in excess of 20 gpm) causing PRZR level to be above program.

D. Incorrect. When charging flow is reduced seal injection flow will rise, causing the need to reduce seal flow.

Technical Reference(s): 2OM-7.1.B (Attach if not previously provided)
2OM-6.4.AAL

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		1
	K/A #	G2.1.8	
	Importance Rating		3.6

Conduct of Operations: Ability to coordinate personnel activities outside the Control Room.

Question: SRO 88

Given the following conditions:

- You are the Shift Manager.
- The Control Room is being evacuated due to a fire.
- Control can NOT be established from the Emergency Shutdown Panel.
- 2OM-56C.4.B, Alternate Safe Shutdown From Outside Control Room is being implemented.

Which ONE of the following describes the method used to direct shutdown activities once the Control Room is evacuated?

A. Proceed to the Fire Brigade Room, turn over Emergency Director responsibility to the STA, initiate contact with Operations personnel by radio, and proceed to the Alternate Shutdown Panel to monitor plant parameters.

B. Proceed to the Technical Support Center, contact the Unit 1 Shift Manager and direct Operations activities using the radio.

C. Proceed to the Alternate Shutdown Panel to place it in service, monitor plant parameters and direct NCO and NO actions using the radio or phone.

D. Proceed to the Operations Support Center until the Emergency Organization is activated, and then report to the Fire Brigade Room to direct activities using the Plant Paging System.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. E-Plan is not turned over to the STA.

B. Incorrect. TSC will not be manned by the Unit Supervisor. E-Plan activities in TSC will be provided by support organization when emergency response facilities are staffed.

C. Correct.

D. Incorrect. Not directed to go to the OSC or direct actions from the Fire Brigade Room.

Technical Reference(s): 2OM-56C.4.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-56.C.1 Objective 4 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 1 because the SRO must understand actions related to Appendix R when normal alternate Shutdown capability is unavailable.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	E11 EK2.2	
	Importance Rating	3.9	

Knowledge of the interrelations between the (Loss of Emergency Coolant Recirculation) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Question: RO 89

Which ONE of the following describes the strategy for maintaining RCS heat removal while performing ECA-1.1, Loss Of Emergency Coolant Recirculation following a small break LOCA?

A. Maintain RCS temperature and pressure stable; reduce SI flow to minimum using one HHSI and one LHSI pump for RCS decay heat removal.

B. Maintain RCS temperature and pressure stable; reduce SI flow to minimum using only one HHSI pump for RCS decay heat removal with both LHSI pumps secured.

C. Initiate a plant cooldown and depressurization; reduce SI flow to minimum using only one LHSI pump for RCS decay heat removal and one HHSI pump aligned to the normal Charging flowpath.

D. Initiate a plant cooldown and depressurization; reduce SI flow to minimum using only one HHSI pump for RCS decay heat removal with both LHSI pumps secured.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. LHSI is not used and a cooldown is initiated.

B. Incorrect. A cooldown is initiated.

C. Incorrect. LHSI pumps are secured and one HHSI pump is aligned for injection mode.

D. Correct.

Technical Reference(s): 2OM-53A.1.ECA-1.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3, Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	G2.2.17	
	Importance Rating		3.5

Equipment Control: Knowledge of the process for managing maintenance activities during power operations.

Question: SRO 89

Given the following conditions:

- A component is removed from service for testing.
- The equipment is declared INOPERABLE and the appropriate Technical Specification action statement has been entered.

Under which ONE of the following circumstances, if any, may the component still be considered AVAILABLE in accordance with NPDAP 8.30, Maintenance Rule Program?

A. The test configuration can be automatically overridden by a valid component starting signal.

B. The equipment under test is tagged for corrective or preventative maintenance only, and a dedicated operator is available to restore the component.

C. Equipment under test is considered available unless the component fails the acceptance criteria of the test.

D. Equipment inoperability requiring Technical Specification action is considered unavailable in all cases.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Equipment tagged out for maintenance is considered unavailable.

C. Incorrect. Does not satisfy the provisions for equipment availability during testing.

D. Incorrect. Can be considered available even if inoperable per T.S.

Technical Reference(s): NPDAP 8.30 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) items 2 and 5 because the SRO must understand rules pertaining to maintenance activities and equipment availability.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	016 K3.06	
	Importance Rating	3.5	

Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: AFW system.

Question: RO 90

The following conditions exist:

- The Unit is at 85% power.
- A loss of main feedwater occurs requiring a reactor trip.
- The reactor does NOT trip.
- 30 seconds after the reactor fails to trip, SG 21A, 21B and 21C NR levels are offscale low.

Given these conditions, AMSAC will...

A. not actuate because it is not armed.

B. trip the main turbine and start the AFW pumps.

C. not actuate because the reactor trip breakers are still closed.

D. trip the reactor, start the AFW pumps, and close the SG blowdown sample valves.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. AMSAC is armed above 40% turbine power.

B. Correct.

C. Incorrect. AMSAC actuation is independent of trip breaker position.

D. Incorrect. AMSAC does not generate a reactor trip.

Technical Reference(s): 2OM-1.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 2 (As available)

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

Question History: Vendor Bank, Previous NRC

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:
May not be an exact KA match but alternative would have been either non-credible failures resulting in operation of equipment, or unimportant failures resulting in no actuation.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	2.2.31	
	Importance Rating		2.9

Equipment Control: Knowledge of procedures and limitations involved in initial core loading.

Question: SRO 90

The Unit is in Mode 6. Refueling operations are in progress.

Under which ONE of the following circumstances, if any, can a manipulator crane fuel handling interlock be **BYPASSED**?

A. ONLY when the mast tube is empty.

B. ONLY when previously approved by the Refueling Supervisor.

C. When directed by Contractor Shift Supervisor in an emergency.

D. When authorized by a written procedure or procedure change.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. No requirement to not have a load on the crane.

B. Incorrect. Refueling Supervisor only authorized during emergency conditions.

C. Incorrect. Not authorized to approve.

D. Correct.

Technical Reference(s): 1/2RP-3.16 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

2LOT4 NRC Written Exam

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 6/7 because the SRO must know the requirements to operate the refueling equipment in an abnormal or emergency situation.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	012 K3.01	
	Importance Rating	3.9	

Knowledge of the effect that a loss or malfunction of the RPS channels, components, and interconnections.

Question: RO 91

Given the following:

- The Unit is operating at 90% power.
- Testing is in progress on Train "B" of SSPS.
- The "B" Reactor Trip Bypass Breaker is racked-in and closed.
- An instrument malfunction results in a reactor trip from the Train "A" Reactor Protection System.

Which ONE of the following described the response of the Reactor Protection System and the effect on the control rods?

A. Only the "A" Reactor Trip Breaker will open; the rod drive power supply remains energized.

B. Only the "A" Reactor Trip Breaker will open; the rod drive power supply is de-energized, and control rods drop into the core.

C Both the "B" Reactor Trip Bypass Breaker and the "A" Reactor Trip Breaker remain closed, the rod drive power supply remains energized.

D. Both the "A" Reactor Trip Breaker and the "B" Reactor Trip Bypass Breaker will open, the rod drive power supply is deenergized, and control rods drop into the core.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. The train "A" SSPS opens the train "A" reactor trip breaker and the train "B" reactor trip bypass breaker.

B. Incorrect. The train "A" SSPS opens the train "A" reactor trip breaker and the train "B" reactor trip bypass breaker.

C. Incorrect. The train "A" SSPS opens the train "A" reactor trip breaker and the train "B" reactor trip bypass breaker.

D. Correct. Both breakers open. When either breaker opens, the rod drive power supply is deenergized and control rods fall into the core.

Technical Reference(s): 2OM-1.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.2.28	
	Importance Rating		3.5

Equipment Control: Knowledge of SRO fuel handling responsibilities.

Question: SRO 91

Which ONE of the following describes the **MINIMUM** supervision required for movement of fuel assemblies in containment in accordance with 1/2RP-3.16, Core Unload?

A. Only the Refueling SRO

B. Contractor Shift Supervisor and Reactor Engineer

C. Refueling SRO and Reactor Engineer

D. Refueling SRO and Contractor Shift Supervisor

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Contractor Shift Supervisor also required.

B. Incorrect. Reactor Engineer not required.

C. Incorrect. Reactor Engineer not required.

D. Correct.

Technical Reference(s): 1/2RP-3.16 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

2LOT4 NRC Written Exam

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 6/7 because the SRO must know requirements for fuel movement.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	073 K4.01	
	Importance Rating	4.0	

Knowledge of PRM system design feature(s) and/or interlocks which provide for the following: Release termination when radiation exceeds setpoint.

Question: RO 92

Given the following:

- The Unit is operating at 100% power with all systems in NSA.
- A liquid waste discharge is in progress to the Unit 2 cooling tower blowdown.
- A High radiation alarm occurs on [2SGC-RQ100], Liquid Waste Process Effluent Monitor.

Which ONE of the following describes the action required?

A. Manually close [2SGC-HCV100], Liquid Waste Effluent High Radiation Isolation Valve terminating the release.

B. Verify [2SGC-HCV100], Liquid Waste Effluent High Radiation Isolation Valve closes automatically immediately terminating the release.

C. Manually open [2SGC-HCV100], Liquid Waste Effluent High Radiation Isolation Valve diverting the release to the Unit 1 boron recovery test tank.

D. Verify [2SGC-HCV100], Liquid Waste Effluent High Radiation Isolation Valve opens automatically immediately diverting the release to the Unit 1 boron recovery test tank.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. 2SGC-HCV100 automatically shuts terminating the release.

B. Correct.

C. Incorrect. 2SGC-HCV100 automatically closes terminating the release.

D. Incorrect. 2SGC-HCV100 closes automatically terminating the release (Unit 1 boron recovery test tank is a potential discharge point for the liquid waste discharge system).

Technical Reference(s): 2OM-43.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-43.1 Objective 6 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	G2.2.25	
	Importance Rating		3.7

Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Question: SRO 92

Regarding Technical Specification Safety Limits, which ONE of the following core limitations does the OTΔT Reactor Trip prevent exceeding?

A. Power Density (KW/ft)

B. Departure from Nucleate Boiling (DNB)

C. Total Core Power

D. Axial Flux Difference (AFD)

Proposed Answer: B

Explanation (Optional):

A. Incorrect. OPΔT trip limits power density.

B. Correct.

C. Incorrect. Power Range High Flux Trip limits total core power.

D. Incorrect. Rod Insertion Limits assist in maintaining AFD within limits.

Technical Reference(s): TS 3.3.1 Bases (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 16 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 2 because the SRO must understand LSSS and basis for protection of Safety Limits.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	075 A2.02	
	Importance Rating	2.5	

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

Question: RO 93

Given the following:

- The Unit is operating at 85% power.
- [2CWS-P21C], Cooling Tower Pump is out of service and unavailable.
- Hotwell temperature is 121°F.
- Outside air temperature is 88°F.
- [2CWS-P21A], Cooling Tower Pump trips.

Which ONE of the following describes the impact on the plant and the required operator response, if any?

A. No action is required, the remaining two running cooling tower pumps will provide adequate flow.

B. Condenser vacuum will degrade. Lower turbine load as necessary to maintain vacuum within limits.

C. Condenser vacuum will be unaffected. Maintain turbine load constant to prevent reactor power from dropping below the P-9 setpoint.

D. Condenser vacuum will be unaffected. If exhaust hood temperatures rise, verify exhaust hood spray valves are open.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Pumps are each 25% capacity. Conditions indicate warm circulating water temperatures. Turbine load must be reduced.

B. Correct.

C. Incorrect. Turbine load should be reduced to recover condenser vacuum.

D. Incorrect. Condenser vacuum will degrade.

Technical Reference(s): 2OM-31.4.AAB (Attach if not previously provided)
2OM-31.1.1C
2OM-53C.4.2.26.2

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

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.4.1	
	Importance Rating		4.6

Emergency Procedures/Plan: Knowledge of EOP entry conditions and immediate action steps.

Question: SRO 93

- The Unit was at 100% power when a turbine trip and a loss of power to both 4KV emergency busses occurs.
- BOTH emergency diesel generators failed to start.
- Reactor power indicates 95% and stable.
- SG safety valves are open.
- All Normal 4KV buses are energized.

Which ONE of the following describes the procedure usage for this event?

A. Enter E-0, Reactor Trip Or Safety Injection. If reactor trip cannot be verified, transition to FR-S.1, Response To Nuclear Power Generation/ATWS to initiate emergency boration.

B. Enter E-0, Reactor Trip Or Safety Injection. If reactor trip cannot be verified, initiate emergency boration to shut down the reactor. Enter FR-S.1 when directed to monitor CSF Status Trees upon restoration of power.

C. Enter ECA-0.0, Loss Of All AC Power. If reactor trip cannot be verified, transition to FR-S.1 to initiate emergency boration.

D. Enter ECA-0.0, Loss Of All AC Power. If reactor trip cannot be verified, continue in ECA-0.0. Transition to FR-S.1 when directed to monitor CSF Status Trees upon restoration of power.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. No power available to initiate emergency boration.

B. Incorrect. No direction to emergency borate in step 0 of E-0.

C. Incorrect. No power to implement FR-S.1.

D. Correct. FR's are monitored only until power is restored.

Technical Reference(s): 1/2OM-53.B.2 (Attach if not previously provided)
2OM-53A.1.E-0
2OM-53A.1.ECA-0.0

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.1 Objective 1 (As available)

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

Question History: BVPS-1 NRC

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must assess the current conditions and evaluate appropriate procedure use.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	086 K4.06	
	Importance Rating	3.0	

Knowledge of design feature(s) and/or interlock(s) which provide for the following: CO2.

Question: RO 94

The following alarms are received in the Control Room:

- [A11-1E], EMERGENCY DIESEL GEN BLDG 2-2 FIRE
- [A11-3E], EMERGENCY DIESEL GEN BLDG 2-2 CO2 SYS TROUBLE

Which ONE of the following describes the operation of the Fire Protection System?

Diesel Generator Building 2-2...

A. Sprinkler System will discharge immediately.

B. CO_2 System will discharge immediately.

C. Sprinkler System will discharge after a time delay.

D. CO_2 System will discharge after a time delay.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. DG Bldg. is CO_2 protected.

B. Incorrect. Pre-$C0_2$ discharge alarm sounds immediately, discharges in 30 seconds.

C. Incorrect. DG Bldg. is CO_2 protected.

D. Correct.

Technical Reference(s): 2OM-33.4.ACN (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-33.1, Objective 8 (As available)

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

Question History: BVPS-2 NRC Exam Editorial Mod

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		3
	K/A #	G2.3.10	
	Importance Rating		3.3

Radiation Control: Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.

Question: SRO 94

Given the following conditions:

- You are required to make an entry to a Locked High Radiation Area.
- Your year-to-date exposure is 2.6 Rem Total Effective Dose Equivalent (TEDE).
- The job is planned to take 20 minutes to complete with 5 minutes transit time each way.
- Transit path radiation levels are 400 mR/hr.
- Work area radiation levels are 1200 mR/hr.

As the Unit Supervisor, you may...

A. perform this task provided you are signed onto a High Radiation Area RWP.

B. not perform this task because you will exceed the BVPS TEDE limit.

C. perform this task provided you meet the requirements for a Planned Special Exposure (PSE).

D. not perform the task because your current year to date exposure is already within 80% of the BVPS Administrative TEDE Limit.

Proposed Answer: A

Explanation (Optional):

A. Correct. 2.6 Rem + (10 min. x 400 mR/hr) + (20 min x 1200 mR/hr) = 3066 mR total for year.

B. Incorrect. TEDE will not be exceeded. No additional levels of approval necessary.

C. Incorrect. PSEs for emergencies with greater dose.

D. Incorrect. 80% of limit is not exceeded.

Technical Reference(s): 1/2-ADM-1601 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History: 2001 BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 4 because the SRO must determine whether dose will be exceeded in a high radiation area.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	1	
	K/A #	G2.1.28	
	Importance Rating	3.2	

Conduct of Operations: Knowledge of the purpose and function of major system components and controls.

Question: RO 95

Which ONE of the following describes a function of [2RCS-TK22], Pressure Relief Tank?

Cools and condenses...

A. excess letdown flow, if required.

B. discharges from the letdown relief valve.

C. discharges from the SI accumulator relief valves.

D. discharges from the LHSI pump recirculation line relief valves.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. PRT does not receive excess letdown flow.

B. Correct.

C. Incorrect. PRT does not receive accumulator relief valve discharge.

D. Incorrect. PRT does not receive LHSI pump relief valve discharge.

2LOT4 NRC Written Exam

Technical Reference(s): 2OM-6.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-6.4 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.2.11	
	Importance Rating		3.4

Equipment Control: Knowledge of the process for controlling temporary changes.

Question: SRO 95

Given the following:

- Planned maintenance on a system requires a portion of the system to be taken out of service for several days.
- A fire hose will be installed to bypass the affected portion of the system.
- The changes to, and operation of, the system will be considered extensive.
- The changes to the system for this maintenance are one-time only.

Which ONE of the following document alterations is to be used for this evolution?

A. Temporary Procedure

B. Significant Change Procedure Revision

C. Simple Change Procedure Revision

D. Procedure Correction

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. Used for new procedures or a total rewrite when the scope is changed.

C. Incorrect. Used to revise procedures when scope does not change.

D. Incorrect. Used for editorial corrections, clarifications, etc.

Technical Reference(s): NOP-SS-3001 (Attach if not previously provided)

2LOT4 NRC Written Exam

1/2-ADM-0101

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-48.1 Objective 12 (As available)

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

Question History: BVPS-1 NRC Exam

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments: Distractor 'C' changed per reviewer comment.
10CFR55.43(b) item 3 because the SRO must know the procedures required to change operation of the facility as intended.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	1	
	K/A #	G2.1.18	
	Importance Rating	2.9	

Conduct of Operations: Ability to make accurate, clear and concise logs, records, status boards, and reports.

Question: RO 96

2OM-54.3.L5, Surveillance Verification Log is being performed for the 0000 - 0800 shift.

The RO determines that the NIS Power Range indications are NOT within allowable limits.

Per 2OM-54.1.A, Station Logs, which ONE of the following describes how this is required to be documented in the L5 log?

A. Circle all readings in red pen that are not in compliance. The Unit Operations Superintendent must review and initial the L5 log prior to the end of the shift.

B. Circle all readings in red pen that are not in compliance. The Unit Supervisor must review and initial the L5 log in the time column next to the unsatisfactory check.

C. Mark 'UNSAT' in the time column opposite the unsatisfactory check. The Unit Supervisor must review and initial the L5 log prior to the end of the shift.

D. Mark 'UNSAT' in the time column opposite the unsatisfactory check. The Unit Operations Superintendent must review and initial the L5 log in the time column next to the unsatisfactory check.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. UOS doesn't initial log.

B. Incorrect. US does not initial next to UNSAT.

C. Correct.

D. Incorrect. UOS doesn't initial next to UNSAT.

Technical Reference(s): 2OM-54.1.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments: Modified 2 distractors by changing Unit Supervisor to Operations Unit Superintendent to clearly make them wrong.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.1.4	
	Importance Rating		3.4

Conduct of Operations: Knowledge of shift staffing requirements.

Question: SRO 96

The Unit is in Mode 1.

As the on-shift Unit Supervisor, Control Room staffing is currently at the MINIMUM required in accordance with Technical Specifications.

The Off-going Reactor Operator (RO) has been on shift for 12 hours. His relief has called in with car trouble and will be 1 hour late.

Which ONE of the following describes how turnover for the RO position will be performed?

A. The Off-going RO must turn over to the Oncoming PO. The RO position may be vacant for up to 2 hours.

B. The Off-going RO must remain on shift until his relief or another qualified designated relief assumes the RO position.

C. The Off-going RO must turn over to the Oncoming Unit Supervisor. The RO position may be vacant for up to 2 hours.

D. The Off-going RO must obtain Plant Manager approval prior to working longer than 12 hours. When approval is granted, the RO may work up to an additional 2 hours or until relieved, whichever is sooner.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Not an emergency, cannot be unmanned upon shift turnover due to absence.

B. Correct.

C. Incorrect. Same reason above.

D. Incorrect. Overtime limit is 16 hours, also the wrong application of the 2 hour rule.

Technical Reference(s): T.S. 6.2.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History: Vendor Bank. Previous NRC Exam

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments: 10CFR55.43(b) item 1 because the SRO must know the Technical Specification on shift staffing and allowable time less than full shift complement.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	2	
	K/A #	G2.2.26	
	Importance Rating	2.5	

Equipment Control: Knowledge of refueling administrative requirements.

Question: RO 97

Per 2OM-51.4.H, Station Shutdown-Plant Conditions And Operations During Refueling (Mode 6), which ONE of the following satisfies the administrative requirements for fuel movement?

A. The refueling cavity water level is at least 20 ft.

B. One RHS loop is in service.

C. Either Source Range Channel N-31 or Channel N-32 is operable.

D. The Source Range High Flux At Shutdown alarm is set between 2 to 3 decades above background.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Level must be at least 23 feet.

B. Correct. One RHS loop is required to be in service.

C. Incorrect. Both source range channels are required to be operable.

D. Incorrect. The source range high flux at shutdown alarm is set 1/2 decade above background.

Technical Reference(s): 2OM-51.4.H (Attach if not previously provided)

2LOT4 NRC Written Exam

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	E11 G2.1.23	
	Importance Rating		4.0

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Question: SRO 97

Given the following:

- The Unit was operating at 100% power when a large break LOCA resulted in reactor trip and safety injection.
- ES-1.3, Transfer To Cold Leg Recirculation was entered from Step 17 of E-1, Loss Of Reactor Coolant, when RWST level dropped below 460 inches.
- ECA-1.1, Loss Of Emergency Coolant Recirculation was entered from Step 4 of ES-1.3 when a flow path from the containment sump could not be established.

Which ONE of the following is required if emergency coolant recirculation capability is established while performing ECA-1.1, Loss Of Emergency Coolant Recirculation?

A. Enter Step 1 of E-1, Loss Of Reactor Coolant.

B. Return to Step 17 of E-1, Loss Of Reactor Coolant.

C. Enter Step 1 of ES-1.3, Transfer To Cold Leg Recirculation.

D. Return to Step 4 of ES-1.3, Transfer To Cold Leg Recirculation.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Procedure has been completed.

B. Incorrect. Procedure has been completed.

C. Incorrect. Steps already performed.

D. Correct. If emergency coolant recirculation capability is restored during the performance of ECA-1.1, recovery actions should continue by returning to the procedure and step that was in effect.

Technical Reference(s): 2OM-53A.1.ECA-1.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 5 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must assess conditions and determine appropriate procedure transition.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	3	
	K/A #	G2.3.1	
	Importance Rating	2.6	

Radiation Control: Knowledge of 10CFR: 20 and related facility radiation control requirements.

Question: RO 98

An operator is stationed at a valve in a confined area continuously for 10 minutes.

The operators year to date TEDE exposure is 300 mR.

Radioactive material on the valve is exposing the operator to 200 mR/hr. Three feet behind the operator is another valve that emits 100 mR/hr at 25 cm.

Which ONE of the following is applicable to this situation?

A. The valve behind the operator must be labeled as a "Hot Spot" and the area posted as a Radiation Area.

B. The operator will exceed 10CFR20 dose limits for TEDE exposure.

C. The area must be posted as a High Radiation Area and the operator must have an ARD, and either dose rate meter and be meter qualified, or have Health Physics coverage.

D. A RadCon Technician must be present to monitor the radiation in the room with a portable neutron meter while the operator is stationed at the valve.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Area meets posting requirements for High Radiation Area (greater than 100 mR/hr.)

B. Incorrect. 33 mR (10 minutes at 200 mR/hr.) will not exceed BVPS TEDE limits.

C. Correct.

D. Incorrect. Not required per 1/2-ADM-1630.

Technical Reference(s): 1/2-ADM-1630 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: RC-01 Objective 32 (As available)

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

Question History: 2001 BVPS-2 Audit Exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	022 AA2.03	
	Importance Rating		3.6

Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Pump Makeup: Failures of flow control valve or controller.

Question: SRO 98

Given the following conditions:

The Unit is at 100% power with all systems in NSA.

ONLY the following annunciators are received in the Control Room:

- [A2-3E], CHARGING FLOW PATH TROUBLE
- [A2-3F], LETDOWN FLOW PATH TROUBLE

- The RO verifies that Pressurizer level is trending DOWN and VCT level is trending UP.
- RCS temperature and pressure are stable.
- No other Control Room annunciators are in alarm.

Which ONE of the following describes the event in progress and the procedure to be utilized?

A. Non-regenerative heat exchanger tube leak; AOP-2.15.1, Loss Of Primary Component Cooling Water.

B. Non-regenerative heat exchanger tube leak; AOP-2.6.7, Excessive Primary Plant Leakage.

C. Charging flow control valve failure; AOP-2.7.1, Loss of Charging or Letdown.

D. Charging flow control valve failure; 2OM-7.4.AAH, RCP Seal Trouble for LOW Seal Injection Flow.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. For a charging leak, VCT level would drop as charging flow control opens to maintain Pressurizer level.

B. Incorrect. If a charging pump tripped, the annunciator would be illuminated in the Control Room.

C. Correct. For a flow controller failed closed, there is a charging and letdown mismatch, with Pressurizer level dropping and VCT level rising.

D. Incorrect. Tube leakage in the non-regenerative heat exchanger would cause VCT level to lower with no affect on Pressurizer level.

Technical Reference(s): 2OM-53C.4.2.1.7 (Attach if not previously provided)
2OM-7.4.AAE

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-7.1 Objective 21 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:

10CFR55.43(b) item 5 because the SRO must assess plant conditions and determine appropriate procedural entry.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	4	
	K/A #	G2.4.2	
	Importance Rating	3.2	

Emergency Procedures/Plan: Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.

Question: RO 99

Given the following sequence of events:

- The Unit was initially operating at 100% power with all systems in NSA.
- One main feedwater pump has tripped.
- 21A SG level is 8% NR and lowering.
- 21B SG level is 10% NR and lowering.
- 21C SG level is 8% NR and lowering.
- [2FWS-P24], Startup Feed Pump is running.
- Plant operation continues at power.

Which ONE of the following describes the procedure(s) that must be performed?

The crew will...

A. manually trip the reactor and enter E-0, Reactor Trip Or Safety Injection.

B. manually trip the reactor and enter FR-S.1, Response To Nuclear Power Generation - ATWS.

C. implement AOP-2.24.2, Loss Of Main Feedwater; if SG levels continue to lower, then enter E-0, Reactor Trip Or Safety Injection.

D. implement AOP-2.24.2, Loss Of Main Feedwater; if SG levels continue to lower, then enter FR-S.1, Response To Nuclear Power Generation - ATWS.

Proposed Answer: A

Explanation (Optional):

A. Correct.

B. Incorrect. FR-S.1 is entered if the reactor fails to trip in E-0.

C. Incorrect. An automatic trip should have occurred on low-low SG level. Any plant condition that requires a manual reactor trip due to failure of an automatic reactor trip requires immediate entry into E-0.

D. Incorrect. FR-S.1 is entered only if the reactor fails to trip manually in E-0.

Technical Reference(s): 2OM-53A.1.E-0 (Attach if not previously provided)
2OM-53A.1.FR-S.1

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.1 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	027 G2.1.30	
	Importance Rating		3.4

Conduct of Operations: Ability to locate and operate components, including local controls.

Question: SRO 99

Given the following:

- A steam bubble is being established in the Pressurizer.
- The RCS Overpressure Protection System (OPPS) is armed.
- RCS pressure has exceeded the OPPS variable setpoint.
- [2RCS*PCV456] and [2RCS*PCV455C], Pressurizer PORVs have opened.
- RCS pressure has dropped below the OPPS setpoint; however, [2RCS*PCV456] and [2RCS*PCV455C] remain OPEN.

Which ONE of the following describes the **MINIMUM** operation(s) necessary to send an additional close signal to both PORV(s)?

A. Manually reduce the Pressurizer Pressure Master Controller output.

B. Manually raise the Pressurizer Pressure Master Controller setpoint.

C. Both PORV control switches must be placed in the 'CLOSE ' position, **AND** both OPPS BLOCK/ARM switches must be placed in the 'BLOCK ' position.

D. Both PORV control switches must be placed in the 'CLOSE ' position, **OR** both OPPS BLOCK/ARM switches must be placed in the 'BLOCK' position.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Master Controller is not controlling at this pressure.

B. Incorrect. Master Controller is not controlling at this pressure.

C. Incorrect. It is unnecessary to operate both of the PORV control switches and both of the BLOCK/ARM switches to close the PORVs.

D. Correct. Both PORV control switches placed in the CLOSE position or both BLOCK/ARM switches placed in the BLOCK position will close both PORVs.

Technical Reference(s): 2OM-6.1.D (Attach if not previously provided)
2OM-6.4.ABD

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 2SQS-6.4 Objective 21 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	017 K5.02	
	Importance Rating	3.7	

Knowledge of the operational implications of the following concepts as they apply to the ITM system: Saturation/Subcooling condition of water.

Question: RO 100

Given the following conditions:

- A small break LOCA has occurred.
- The crew is performing the actions in E-1, Loss Of Reactor Or Secondary Coolant when the STA confirms a Core Cooling Orange Path condition.
- RVLIS Full Range indicates 30%.
- Core exit thermocouples indicate 585°F.
- RCS pressure indicates 1200 psig.

Which ONE of the following describes the status of the Reactor Coolant System?

A. Subcooled > 10°F

B. Subcooled 1 - 10°F

C. Saturated

D. Superheated

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Approximately 25°F superheat per steam tables.

B. Incorrect.

C. Incorrect.

D. Correct. Distractors plausible because a different combination of conditions for Core Cooling Orange path could place subcooling at or near saturation, in situations with RVLIS < 40%.

Technical Reference(s): Steam Tables (Attach if not previously provided)

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

Learning Objective: _____ (As available)

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

Question History: Vendor Bank, Previous NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge Application
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	037 G2.2.22	
	Importance Rating		4.1

Equipment Control: Knowledge of limiting conditions for operations and safety limits.

Question: SRO 100

Given the following conditions:

- A Unit startup is in progress.
- The latest RCS leak rate data indicates the following:
  - 0.98 gpm UNIDENTIFIED leakage to Containment atmosphere
  - 2.4 gpm total Pressure Isolation Valve leakage. The maximum leakage from one valve is 0.39 gpm.
  - 21A SG - 0.091 gpm
  - 21B SG - 0.098 gpm
  - 21C SG - 0.118 gpm

Using the attached Technical Specification reference, which ONE of the following leakage limits, if any, is being exceeded?

A. Unidentified

B. Primary-to-Secondary

C. Pressure Isolation Valve

D. All leakage is less than Technical Specification limits

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Unidentified leakage limit is 1 gpm.

B. Correct. 21C SG leakage is greater than 150 gpd (.118 gpm)

C. Incorrect. PIV leakage is 5 gpm. Action starts at 0.5 gpm per inch of diameter. At this leakage, no valve exceeds that amount.

D. Incorrect. 21C SG is above the leakage limit.

Technical Reference(s): T.S. 3.4.6.2 (Attach if not previously provided)
T.S. 3.4.6.3

Proposed References to be provided to applicants during examination: T.S. 3.4.6.2 & 3.4.6.3

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 2 because the SRO must know TS entry conditions.