

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

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

Proposed Question: Common 1

Given the following conditions:

- The plant is at 29% power.
- "C" RCP must be shut down.

Which ONE (1) of the following describes the effect on "C" SG parameters and the action required prior to tripping "C" RCP?

"C" SG...

- A. level will swell as steam flow rises. Reduce feed flow to "C" SG to prevent level from going above P-14.
- B. level will shrink as steam flow lowers. Raise feed flow to "C" SG to prevent level from going below the SG Low-Low level trip setpoint.
- C. pressure will rise, causing indicated level to rise. Ensure Steam Generator Level Control is automatically controlling "C" SG level at program.
- D. pressure will lower, causing indicated level to lower. Ensure Steam Generator Level Control is automatically controlling "C" SG level at program.

Proposed Answer: B. level will shrink as steam flow lowers. Raise feed flow to "C" SG to prevent level from going below the SG Low-Low level trip setpoint.

Explanation (Optional):

Level will shrink as heat input is reduced when the pump is tripped. With heat input reduced, pressure will reduce slightly, causing a small DP between SGs that will result in less (or no) steam flow from "C" SG. A is plausible because post trip, SG level on the affected SG always indicates higher than the unaffected SGs because it has been fed to 70% prior to the trip. It is wrong because steam flow does not rise, although it is fed to between 70% and P-14. C and D are wrong because manual control of the affected SG is used to fill it prior to RCP trip. C is also wrong because pressure will rise. It is a common misconception that SG pressure compensates level. It compensates steam flow.

Technical Reference(s): OFN-BB-005, Att B or C (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732415 R3 (As available)

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

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

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

10 CFR Part 55 Content: 55.41 14  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	004 K5.43	
	Importance Rating	3.6	

Knowledge of the operational implications of the following concepts as they apply to the CVCS: Saturation, subcooling, superheat in steam/water

Proposed Question: Common 2

Given the following conditions:

- A load rejection from 100% to 70% power has occurred.
- Power is stable.
- Pressurizer level indicates 60%.
- "B" CCP is in service.
- Letdown flow indication is oscillating.

Which ONE (1) of the following describes the cause of the letdown flow oscillations, and the action required?

- A. Letdown Heat Exchanger steam flashing; LOWER the setpoint of the Letdown Heat Exchanger Outlet Pressure Control Valve, BG PCV-131.
- B. Letdown Heat Exchanger steam flashing; RAISE the setpoint of the Letdown Heat Exchanger Outlet Pressure Control Valve, BG PCV-131.
- C. Regenerative Heat Exchanger steam flashing; Place CCP Charging Flow Control Valve, BG FCV-121 in MANUAL and throttle OPEN.
- D. Regenerative Heat Exchanger steam flashing; Place CCP Charging Flow Control Valve, BG FCV-121 in MANUAL and throttle CLOSED.

Proposed Answer: C. Regenerative Heat Exchanger steam flashing; Place CCP Charging Flow Control Valve, BG FCV-121 in MANUAL and throttle OPEN.

Explanation (Optional):

For transients where actual pressurizer level is greater than setpoint, Charging flow will be reduced, without a corresponding reduction in letdown flow. This reduces the heat transfer across the RHX and may result in letdown temperature exceeding the saturation limit for the corresponding pressure in the system. A and B are plausible because flashing may occur during CVCS system startup if PCV-131 pressure was not correctly set. They are incorrect because for these plant conditions, the only way to cool letdown is to raise charging flow. D is incorrect because although the correct controller is operated, it should be operated in the opposite direction

Technical Reference(s): ALR 00-038A, 042A (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: SY 130400 Obj 6 (As available)

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

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

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

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

Comments:

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

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

Proposed Question: Common 3

Given the following conditions:

- The plant was at 100% power with all systems aligned in their normal configurations.
- A transient has occurred requiring Emergency Boration in accordance with OFN BG-009, EMERGENCY BORATION.
- BG HCV-8104, Emergency Borate to Charging Pump Suction Valve, will NOT open.

Which ONE (1) of the following describes the MINIMUM valve alignment required to initiate RCS boration?

- OPEN ONE Charging Pump suction from RWST valve, BN HCV-112D or 112E, and CLOSE ONE VCT Outlet Valve, BG HCV-112B or 112C.
- OPEN ONE Charging Pump suction from RWST valve, BN HCV-112D or 112E, and CLOSE BOTH VCT Outlet Valves, BG HCV-112B and 112C.
- OPEN BOTH Charging Pump suction from RWST valves, BN HCV-112D and 112E, and CLOSE ONE VCT Outlet Valve, BG HCV-112B or 112C.
- OPEN BOTH Charging Pump suction from RWST valves, BN HCV-112D and 112E, and CLOSE BOTH VCT Outlet Valves, BG HCV-112B and 112C.

Proposed Answer: A. OPEN ONE Charging Pump suction from RWST valve, BN HCV-112D or 112E, and CLOSE ONE VCT Outlet Valve, BG HCV-112B or 112C.

Explanation (Optional):

RWST valves provide a parallel flowpath, so opening either 1 will provide flow to charging pump suction. VCT outlet valves are aligned in series, so closing either 1 of those will isolate the VCT flowpath to charging. All distractors are plausible if the candidate misunderstands the valve configuration for boration control

Technical Reference(s): OFN BG-009 step 2.b RNO (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732419 R3 (As available)

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

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

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

10 CFR Part 55 Content: 55.41 6  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	005 K2.01	
	Importance Rating	3.0	

Knowledge of bus power supplies to the following: RHR pumps

Proposed Question: Common 4

Which ONE (1) of the following busses directly supply power to RHR Pumps “A” and “B”?

- A. NB01 and NB02
- B. PB01 and PB02
- C. NG03 and NG04
- D. NN03 and NN04

Proposed Answer: A. NB01 and NB02

Explanation (Optional):

RHR Pumps are powered from NB Busses. RHR valves are powered from NG Busses, and RHR instrumentation is powered from NN. PB supplies normal power to Non-Safety Related busses from off-site

Technical Reference(s): CKL EJ-120, Att B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 130500 R4 (As available)

Question Source:

Bank #	X
Modified Bank #	<u>                </u> (Note changes or attach parent)
New	<u>                </u>

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 3  
55.43       

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	006 G2.1.27	
	Importance Rating	2.8	

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

Proposed Question: Common 5

All of the following are design functions (acceptance criteria) of the ECCS with the **EXCEPTION** of...

- A. maintaining peak fuel centerline temperature below 4700 degrees F.
- B. maintaining long term core cooling with a single active or passive failure.
- C. minimizing total cladding oxidation to 17% of the total cladding thickness prior to oxidation.
- D. maintaining maximum Hydrogen generation at a maximum of 1% of the amount possible if all of the cladding was to react.

Proposed Answer: A. maintaining peak fuel centerline temperature below 4700 degrees F.

Explanation (Optional):

A is correct. Fuel melts at approximately 4700 degrees F and cladding temperature would be higher than the 2200 degrees F that the ECCS is designed for. All the other distractors are design acceptance criteria

Technical Reference(s): 10CFR50.46 (Attach if not previously provided)  
USAR 6.3

Proposed references to be provided to applicants during examination: None

Learning Objective: SY 130600 R1 (As available)

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

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

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41   7    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	007 A1.02	
	Importance Rating	2.7	

Ability to predict and/or monitor changes (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining Quench Tank Pressure

Proposed Question: Common 6

Given the following conditions:

- The plant is at 100% power.
- The following annunciator is received:
  - 34E, PRT PRESS HI

PRT pressure is 7 psig and RISING SLOWLY.  
PRT level is 67% and STABLE.

If allowed to continue, which ONE (1) of the following is the potential impact of this event and the actions required to restore PRT pressure?

- (1) The PRT rupture disc will discharge to containment when pressure rises to\_\_\_\_\_.
  - (2) \_\_\_\_\_ to prevent PRT rupture disc operation.
- A. (1) 50 psig  
(2) Vent the PRT.
  - B. (1) 100 psig  
(2) Vent the PRT.
  - C. (1) 50 psig  
(2) Drain the PRT to the RCDT to reduce level and pressure.
  - D. (1) 100 psig  
(2) Drain the PRT to the RCDT to reduce level and pressure.

Proposed Answer: B. (1) 100 psig  
(2) Vent the PRT.

Explanation (Optional):

A and C are incorrect because the PRT rupture disc will discharge at 100 psig.

C and D are incorrect because draining the PRT to reduce pressure is not required with the PRT at this level and stable, and draining to the containment sump is only performed during emergencies.

Technical Reference(s): ALR 00-34E (Attach if not previously provided)  
SYS BB-202, section 6.4

Proposed references to be provided to applicants during examination: None

Learning Objective: 1300200 R2 (As available)

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

Question History: Last NRC Exam           

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

10 CFR Part 55 Content: 55.41 10  
55.43           

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	008 A1.02	
	Importance Rating	2.9	

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

Proposed Question: Common 7

Which ONE (1) of the following describes how temperature controllers TIC-29 and TIC-30 maintain CCW temperature within limits?

- A. Manually set to maintain a constant flow in the CCW system by controlling the amount of flow that bypasses the CCW heat exchangers.
- B. Periodically adjusted to vary total flow through the CCW system to maintain CCW temperature as required by plant operating conditions.
- C. Periodically adjusted to vary the amount of CCW flow through the CCW heat exchangers to maintain temperature within the required band.
- D. Manually set to maintain a constant temperature downstream of the CCW heat exchangers by controlling the amount of CCW flow that bypasses the CCW heat exchangers.

Proposed Answer: D. Manually set to maintain a constant temperature downstream of the CCW heat exchangers by controlling the amount of CCW flow that bypasses the CCW heat exchangers.

Explanation (Optional):

TIC-29 and TIC-30 control CCW temperature by regulating the amount of CCW HX bypass flow. The valve controller is set to maintain a temperature and is not changed. A is incorrect but plausible because the action is similar to RHR heat exchanger flow control. B and C are incorrect because setpoints are not periodically adjusted. They are plausible because both methods would change or maintain temperature.

Technical Reference(s): DWG M-12EG02 (Attach if not previously provided)  
USAR 9.2.2.2.3

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 1400800 R2 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 4  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	010 A2.03	
	Importance Rating	4.1	

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

Proposed Question: Common 8

Given the following conditions:

- The plant is at 100% power.
- The crew is performing OFN BB-007, RCS LEAKAGE HIGH, due to a decrease in RCS pressure and an increase in PRT pressure and temperature.
- RCS pressure is currently 2100 psig and slowly lowering.
- PRT pressure is 18 psig and slowly rising.
- PORV discharge tailpipe temperatures are elevated.

Which ONE (1) of the following describes the impact on plant operation, and the actions required?

- OP Delta T setpoint is lowering. Manually trip the reactor due to RCS pressure being below 2185 psig.
- OT Delta T setpoint is lowering. Manually trip the reactor due to RCS pressure being below 2185 psig.
- OP Delta T setpoint is lowering. Attempt to close the leaking PORV or associated Block valve prior to reaching a reactor trip setpoint.
- OT Delta T setpoint is lowering. Attempt to close the leaking PORV or associated Block valve prior to reaching a reactor trip setpoint.

Proposed Answer: D. OT Delta T setpoint is lowering. Attempt to close the leaking PORV or associated Block valve prior to reaching a reactor trip setpoint.

Explanation (Optional):

For RCS pressure reductions, OT Delta T is affected. The pressure input to OP Delta T has been zeroed out. Reactor trip is not required at 2100 psig. 2185 psig is the pressure at which open PORVs and block valves should automatically close. OFN BB-007 directs the crew to attempt isolation by closing the PORV or associated block valve, then checking that RCS pressure has stabilized.

Technical Reference(s): OFN BB-007 Step 6.a RNO (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732417 R3 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	012 G2.1.28	
	Importance Rating	3.2	

Conduct of Operations: Knowledge of the purpose and function of major system components and controls.

Proposed Question: Common 9

The unit is in Mode 1, 100% power.

Reactor Protection System Logic Channel 1 (Train 'A') is undergoing trip testing.

Which one of the following describes how an inadvertent reactor trip is prevented during the breaker testing?

- A. Reactor Trip Bypass Breaker 'A' is racked in and closed. It will open on a reactor trip signal from Train 'A'.
- B. Reactor Trip Bypass Breaker 'A' is racked in and closed. It will open on a reactor trip signal from Train 'B'.
- C. Reactor Trip Bypass Breaker 'B' is racked in and closed. It will open on a reactor trip signal from Train 'A'.
- D. Reactor Trip Bypass Breaker 'B' is racked in and closed. It will open on a reactor trip signal from Train 'B'.

Proposed Answer: B. Reactor Trip Bypass Breaker 'A' is racked in and closed. It will open on a reactor trip signal from Train 'B'.

Explanation (Optional):

- A. Incorrect because the RTBB for Train A gets its trip signal from Train B
- B. Correct
- C. Wrong Bypass Breaker. Right Train.
- D. Wrong breaker. Wrong Train. Function of breaker is correct. Just not answer to question posed. These distractors are plausible because the alignment of the RTBBs must be understood as well as the logic of cross-train trips and purpose of the component for testing

Technical Reference(s): USAR Figure 7.1-1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 1301200 R4 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 7  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	013 K3.01	
	Importance Rating	4.4	

Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Fuel

Proposed Question: Common 10

Given the following conditions:

- A LOCA has occurred.
- RCS pressure is 100 psig.
- Both SI pumps are tripped.
- CCP A is operating as designed.
- CCP B is tripped.
- Both RHR Pumps are tripped
- Rx Vessel Level is 20%

If this condition continues, which ONE (1) of the following describes the effect on the fuel assemblies?

- A. Fuel failure will NOT occur. Minimum safety function requirements are met.
- B. Fuel failure will NOT occur. SI Accumulator injection will maintain core cooling.
- C. Fuel failure may occur. Minimum safety function requirements are NOT met.
- D. Fuel failure may occur. Minimum safety function requirements are met, but the break is too large for a CCP pump to provide core cooling.

Proposed Answer: C. Fuel failure may occur. Minimum safety function requirements are NOT met.

Explanation (Optional):

- A. Incorrect. Safety Function requires 1 full train of ECCS
- B. Incorrect. SI Accumulator Injection design basis is for refill on a LBLOCA with LOOP. For this event, they have already performed their design function
- C. Correct.
- D. Incorrect. Minimum SF are NOT met with less than 1 full train of ECCS

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

Proposed references to be provided to applicants during examination: None

Learning Objective: 1300600 R2 (As available)

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

Question History: Last NRC Exam           

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

10 CFR Part 55 Content: 55.41 X  
55.43           

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>022 A4.01</u>	<u>          </u>
	Importance Rating	<u>3.6</u>	<u>          </u>

Ability to manually operate and/or monitor in the control room: CCS fans

Proposed Question: Common 11

Given the following conditions:

- The plant is at 100% power.
- Containment Cooler "A" fan is running in fast speed.
- A reactor trip and safety injection actuation occurs.

50 seconds after SI actuates, which ONE (1) of the following describes the status of Containment Cooler "A" Fan?

- A. Running in SLOW speed
- B. Running in FAST speed
- C. Tripped, and awaiting restart from the load sequencer
- D. Tripped, and must be manually restarted in SLOW or FAST speed

Proposed Answer: A. Running in SLOW speed

Explanation (Optional):

On SI actuation, Containment Cooler fans will be stripped and will restart in slow speed at 35 seconds on the LOCA sequencer. The fan would be running in fast with no SI actuation present. C is incorrect because it would already be started at 35 seconds. D is incorrect because there is no signal that would block the fan from restarting for SI actuation.

Technical Reference(s): DWG E-13GN02 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1302600 R9 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 7  
55.43                     

Comments:

Called bank because other similar items exist



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

10 CFR Part 55 Content: 55.41   7    
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	026 A1.03	
	Importance Rating	3.5	

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

Proposed Question: Common 13

Given the following conditions:

- A LOCA has occurred.
- The crew has transferred suctions to the Containment Recirc. Sump.
- Due to indications of cavitation, the crew has entered EMG C-13, CONTROL ROOM RESPONSE TO SUMP BLOCKAGE.

Which ONE (1) of the following describes the operation of the Containment Spray Pumps for this condition?

- A. Containment Fan Coolers should be placed in service and all Containment Spray Pumps stopped.
- B. Containment Spray Pump discharge flow should be throttled until indications of pump cavitation is corrected.
- C. Containment Spray Pump suction valves should be realigned to the RWST until the cause of the sump blockage is corrected.
- D. One train of Containment Spray should be stopped and one train left running to ensure minimum safety function for containment spray flow is met.

Proposed Answer: A. Containment Fan Coolers should be placed in service and all Containment Spray Pumps stopped.

Explanation (Optional):

Spray will be stopped with fan coolers in service. RHR will also be stopped. Distractors are plausible because all of them will lower flow, reducing the probability of cavitation. They are wrong because they are not directed by the procedure.

Technical Reference(s): EMG C-13, Steps 3,4 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732332 R3 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	039 K5.08	
	Importance Rating	3.6	

Knowledge of the operational implications of the following concepts s the apply to the MRSS: Effect of steam removal on reactivity

Proposed Question: Common 14

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 operating crew, which ONE (1) of the following describes the immediate effect on the plant?

- A. RCS Temperature INCREASES; Power INCREASES.
- B. RCS Temperature DECREASES; Power INCREASES.
- C. RCS Temperature INCREASES; Power DECREASES.
- D. RCS Temperature DECREASES; Power DECREASES

Proposed Answer: B. RCS Temperature DECREASES; Power INCREASES.

Explanation (Optional):

- A: Incorrect. More steam demand will cause temperature to decrease.
- 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 high boron concentration.

Technical Reference(s): GEN 00-003 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1610721 R3 (As available)

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

Question History: Last NRC Exam           

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

10 CFR Part 55 Content: 55.41 1  
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	059 K1.04	
	Importance Rating	3.4	

Knowledge of the physical connections and/or cause-effect relationships between the MFW and the following systems: S/GS water level control system

Proposed Question: Common 15

The unit is at 100% with control rods in AUTOMATIC.

What is the plant response if AC-PT507, Steam Header Pressure Transmitter, failed to 1500 psig?

- A. Steam dumps arm and open, Feed Reg valves throttle open.
- B. Steam dumps arm and open, Feed Reg Valves throttle closed.
- C. Feed pump speed decreases and all Feed Reg Valves throttle open.
- D. Feed pump speed increases and all Feed Reg Valves throttle closed.

Proposed Answer: D. Feed pump speed increases and all Feed Reg Valves throttle closed due to a steam flow-feed flow mismatch.

Explanation (Optional):

If steam pressure failed high, it would cause a low DP between feed and steam pressure. This would be sensed by the Main Feed Pumps as an increase in demand because SGWLC tries to maintain a constant DP. As Feed Pump Speed increases, Feed flow will increase without a corresponding rise in steam flow, causing SG level to rise. This will cause FRVs to throttle closed to maintain level. Steam Dumps would not open because it takes 2 separate signals. They would have a modulate signal in this configuration and power level, but would not be armed

Technical Reference(s): 1505900 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1505900 R5 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 4  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	059 K4.14	
	Importance Rating	3.1	

Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Start permissives for MFW pumps

Proposed Question: Common 16

The plant is at 2% power.

Which ONE (1) of the following conditions will PREVENT the Startup Feed Pump from starting?

- A. MDAFW Pump "A" or "B" is RUNNING.
- B. Bus PB03 is de-energized due to a fault.
- C. Pump Discharge Valve, AE HV-103, is CLOSED.
- D. Condensate Return to Heater Drain Tank, BM TV-40, is CLOSED.

Proposed Answer: C. Pump Discharge Valve, AE HV-103, is CLOSED.

Explanation (Optional):

Pump discharge is required to be open for the pump to start. TV-40 is required to be closed to prevent excess flow through the BD RHX. The MDAFW pumps may be running, but in normal operations, the Startup Feed Pump is stopped when the MDAFW pumps are started. Power is supplied by PB04 for Startup Feed Pump

Technical Reference(s): DWG E-13AE19 and 20 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 15 059 00 R7 (As available)

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

New

X

Question History:

Last NRC Exam

Question Cognitive Level:

Memory or Fundamental Knowledge  
Comprehension or Analysis

X

10 CFR Part 55 Content:

55.41 4

55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	061 A3.02	
	Importance Rating	4.0	

Ability to monitor automatic operation of the AFW, including: RCS cooldown during AFW operations

Proposed Question: Common 17

Given the following conditions:

- The plant is in Mode 3 following a reactor trip.
- An immediate plant cooldown of 50°F/hr. is required using AFW.

Assuming SG level is held constant, which ONE of the following describes the trend of auxiliary feedwater flow requirements as the plant cools down to Mode 5?

- A. AFW flow requirements are constant as long as SG level remains constant.
- B. AFW flow requirements are constant as long as the cooldown rate remains constant.
- C. Less AFW flow is required to maintain SG level because heat input to the SG's decrease as the cooldown continues.
- D. More AFW flow is required to maintain SG level due to the increased density of the SG water as it cools.

Proposed Answer: C. Less AFW flow is required to maintain SG level because heat input to the SG's decrease as the cooldown continues.

Explanation (Optional):

- A. Incorrect. It takes less feedwater to maintain level constant as the RCS cooldown continues. Otherwise, AFW pumps would be adequate for full power operation.
- B. Incorrect. Even though the cooldown rate is constant, less heat is being removed as temperature goes down because decay heat is lower over time.
- C. Correct.
- D. Incorrect. Density will increase, but the effect is minimal compared to decay heat change.

Technical Reference(s): Thermo (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: Last NRC Exam \_\_\_\_\_

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

10 CFR Part 55 Content: 55.41 14  
55.43 \_\_\_\_\_

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>062 K4.10</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>          </u>

Knowledge of AC Distribution design features and/or interlocks which provide for the following: Uninterruptible AC power sources

Proposed Question: Common 18

Given the following conditions:

- The plant is at 100% power.
- All systems are in normal alignments.
- The feeder to Load Center NG01 trips on overcurrent.
- NO operator action has been taken.

Which ONE (1) of the following describes the power source for 120 VAC Instrument Bus NN01?

- A. Battery NK11
- B. SOLA Transformer
- C. Battery Charger NK21
- D. Battery Charger NK25

Proposed Answer: A. Battery NK11

Explanation (Optional):

The battery will automatically supply the inverter on a loss of the normal charger. (NK21) The alternate charger or the SOLA transformer must be manually placed in service. NK21 is deenergized on loss of load center NG01

Technical Reference(s): DWG E-13NN01 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 1506300 R4 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	063 A3.01	
	Importance Rating	2.7	

Ability to monitor automatic operation of the dc electrical system, including: Meters, annunciators, dials, recorders, and indicating lights

Proposed Question: Common 19

Which ONE (1) of the following describes a plant condition that will illuminate the "Battery Monitor" white light on a 125V DC bus?

- A. Bus voltage is above 130 VDC
- B. Bus voltage is below 105 VDC
- C. The ground detection circuit has continuity.
- D. Battery discharge current exceeds 125 amps

Proposed Answer: B. Bus voltage is below 105 VDC

Explanation (Optional):

With either a battery voltage below 105 or a voltage difference between center tap and positive or negative taps is greater than 1.2 VDC, the battery monitor light illuminates

**Technical Reference(s):** Local ALR 301 (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: Last NRC Exam

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

10 CFR Part 55 Content: 55.41   7    
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	063 A2.01	
	Importance Rating	2.5	

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

Proposed Question: Common 20

Given the following conditions:

- The plant is at 100% power.
- A ground is indicated on DC Bus NK02.
- The crew is attempting to locate and isolate the ground using the alarm response procedure.

Which ONE (1) of the following describes the action required to locate the ground and the indication available when the ground has been identified?

- A. Isolate Bus supply sources one at a time. The grounded component has been identified when both positive and negative to ground indications are approximately 65-70 volts.
- B. Isolate equipment feeders from the bus individually. The grounded component has been identified when both positive and negative to ground indications are approximately 130 volts.
- C. Isolate the most probable source of the ground based upon operating equipment. The grounded component is identified when both positive and negative to ground indications are 0 volts.
- D. Isolate the most probable source of the ground based upon operating equipment. The grounded component has been identified when the Bus Ground annunciator stops flashing.

Proposed Answer: A. Isolate Bus supply sources one at a time. The grounded component has been identified when both positive and negative to ground indications are approximately 65-70 volts.

Explanation (Optional):

65 – 70 volts is normal positive or negative to ground indication. Lower voltage means a ground is present. If one terminal indicated 130 volts, the other would indicate 0, which would be a ground. The alarm would only stop flashing when acknowledged.

Technical Reference(s): ALR 302, Att A (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1506300 R2 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	064 A4.03	
	Importance Rating	3.2	

Ability to manually operate and/or monitor in the control room: Synchroscope.

Proposed Question: Common 21

Given the following conditions:

- "B" EDG is being synchronized to its associated bus for surveillance.
- When the Synch switch is placed in "ON", the synchroscope pointer begins to move very slowly in the COUNTER-CLOCKWISE direction.

Which ONE (1) of the following actions is required prior to synchronizing the EDG?

- A. Place EDG voltage control in RAISE
- B. Place EDG voltage control in LOWER
- C. Place EDG governor control in RAISE
- D. Place EDG governor control in LOWER.

Proposed Answer: C. Place EDG governor control in RAISE

Explanation (Optional):

With the synchroscope moving counter-clockwise, the EDG will be going at a lower frequency than the running source. In order to pick up real load, speed must be raised. Lowering frequency will make the synchroscope move at a higher speed in the wrong direction. Voltage control will not change synchroscope speed, but will change the reactive load picked up by the EDG when in parallel.

Technical Reference(s): STS KJ-015B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1406401 R3 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	064 A2.16	
	Importance Rating	3.3	

Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of offsite power during full-load testing of ED/G

Proposed Question: Common 22

Given the following conditions:

- The unit is operating at 25% power.
- Emergency Diesel Generator (EDG) A is loaded to 5800 KW while operating in parallel with the grid during a surveillance test.
- A reactor trip and safety injection occurs coincident with a Loss of Off-Site Power.

Which ONE (1) of the following describes the response of EDG "A" output breaker, and the subsequent action required?

EDG "A" output breaker will...

- A. remain closed with EDG A load less than 5800 KW. Trip the EDG to initiate load sequencing.
- B. remain closed with EDG A load greater than 5800 KW. Trip the EDG to initiate load sequencing.
- C. open and then reclose to allow the sequencer to load. Verify automatic load sequencing occurs.
- D. open and remain open. Reset and restart the EDG to initiate automatic load sequencing.

Proposed Answer: C. open and then reclose to allow the sequencer to load. Verify automatic load sequencing occurs.

Explanation (Optional):

DG Sequencer will initiate a trip of the DG output breaker when SI occurs and off-site power is lost. Once the breaker is open, the sequencer starts its process for reclosing the breaker and placing appropriate loads on the bus. A and B are plausible because if load shed occurs with EDG tied to the bus, load will decrease. If there was an SI and the EDG was tied to the bus, then load may increase. D is plausible because when the EDG is placed in parallel mode for surveillance testing, controls are placed in positions other than the standby positions.

Technical Reference(s): E-13NE10, E-12NF01 (Attach if not previously provided)  
E-13KJ01A

Proposed references to be provided to applicants during examination: None

Learning Objective: 1406401 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 7  
55.43                     

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	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

Proposed Question: Common 23

The plant is currently in Mode 3.

The Radwaste Operator is releasing the contents of Waste Monitor Tank "A" to the cooling lake per SYS HB-130, WASTE MONITOR TANK A DISCHARGE TO THE ENVIRONS.

The Radwaste Operator informs the Control Room that the discharge valve tripped closed, automatically terminating the release.

Which ONE (1) of the following conditions caused valve closure?

- A. Two Circulating Water pumps were running and one tripped, resulting in low dilution flow.
- B. HI-HI Radiation alarm on HB RE-018, Liquid Radwaste Discharge Monitor.
- C. High Waste Monitor Tank Pump Discharge flow on HB FT-1085.
- D. Low level in Waste Monitor Tank "A".

Proposed Answer: B. HI-HI Radiation alarm on HB RE-018, Liquid Radwaste Discharge Monitor.

Explanation (Optional):

A is incorrect because it takes trip of all 3 pumps to cause low dilution flow. B is correct, high rad will stop release. D is incorrect. Low level will cause the pump to stop but valve will stay open. C is incorrect. There is no action but it is undesirable to discharge at a high rate

Technical Reference(s): DWG M12HB03 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1406904 R9 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>076 K2.08</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>          </u>

Knowledge of bus power supplies to the following: ESF-actuated MOVs.

Proposed Question: Common 24

Which ONE (1) of the following describes the alignment and power supply arrangement for the valves in the Essential Service Water System supply and return lines from the Service Water System?

- A. Two valves in parallel on each line; power provided by associated train only.
- B. Two valves in parallel on each line; one valve powered by each train.
- C. Two valves in series on each line; power provided by associated train only.
- D. Two valves in series on each line; one valve powered by each train.

Proposed Answer: D. Two valves in series on each line; one valve powered by each train.

Explanation (Optional):

Two valves in series are powered from opposite trains to ensure single failure does not cause ESW system failure to perform its intended function on LOOP or SI.

Technical Reference(s): M-12EA01, M-12EF01, EF02 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1408900 R6 (As available)

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

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

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41   7    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	078 K3.01	
	Importance Rating	3.1	

Knowledge of the effect that a loss or malfunction of the IAS will have on the following: Containment air system

Proposed Question: Common 25

Given the following conditions:

- A Loss of Instrument Air has occurred.
- Instrument Air system pressure is 20 psig.
- The reactor has been tripped.
- The crew is performing the actions of EMG E-0, REACTOR TRIP OR SAFETY INJECTION.

Which ONE (1) of the following describes the method(s) that will be available to reduce RCS pressure, if necessary?

- A. PZR Spray, AUX Spray and PZR PORVs
- B. PZR Spray and PZR PORVs ONLY
- C. AUX Spray and PZR PORVs ONLY
- D. PZR PORVs ONLY

Proposed Answer: D. PZR PORVs ONLY

Explanation (Optional):

PORVs will remain available for RCS pressure control, but Main Spray and Aux Spray valves fail closed on a loss of instrument air pressure. Some safety related components have nitrogen backup and will remain available (ARVs) but not the main or auxiliary spray valves.

Technical Reference(s): OFN KA-019, Att I, pg 1,2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1407800 R3 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>078 K1.02</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: Service air

Proposed Question: Common 26

What will occur upon a decreasing Instrument Air System pressure due to an air line break at the condensate demineralizers?

- A. The Lag air compressor loads at 115 psig; and all air compressors start at 112 psig.
- B. Service Air header isolation valve KA PV-11 will close at 115 psig; the Lag air compressor loads at 114 psig.
- C. The Standby air compressor loads at 115 psig; the Service Air Header Isolation valve KA PV-11 opens at 110 psig.
- D. The Standby air compressor starts at 112 psig; the Service Air Header Isolation valve KA PV-11 closes at 110 psig.

Proposed Answer: D. The Standby air compressor starts at 112 psig; the Service Air Header Isolation valve KA PV-11 closes at 110 psig.

Explanation (Optional):

Standby compressor starts at 112 psig and KA-PV-11 will close at 110 psig. The isolation valve closes, does not open

Technical Reference(s): OFN-KA-019 Entry Conditions (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 21055 (As available)

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

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

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41   7    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>103 K1.03</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>          </u>

Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: Shield building vent system

Proposed Question: Common 27

Which ONE (1) of the following describes where the Containment Hydrogen Control System Hydrogen Mixing Fans take suction from?

- A. Inside the Reactor Vessel Head Shroud
- B. Loop areas above the Reactor Coolant Pumps
- C. Lower Containment Atmosphere below the Reactor Vessel
- D. Higher Containment Atmosphere above the Reactor Vessel Cavity

Proposed Answer: B. Loop areas above the Reactor Coolant Pumps

Explanation (Optional):

SG Compartments – Loop near RCPs

Technical Reference(s): M-12 GN01 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1303200 R4 (As available)

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

Question History: Last NRC Exam

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

10 CFR Part 55 Content: 55.41   8    
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	103 K4.06	
	Importance Rating	3.1	

Knowledge of containment system design feature(s) and/or interlock(s) which provide for the following: Containment isolation system

Proposed Question: Common 28

Given the following conditions:

- A LOCA has occurred.
- RCS pressure is 1100 psig and lowering.
- Containment pressure is currently 19 psig and rising.
- All automatic actions have occurred as required.
- No manual actions have been taken.
- The crew has entered EMG E-0, REACTOR TRIP OR SAFETY INJECTION.

Which ONE (1) of the following describes the ESF actuations that have taken place?

Safety Injection...

- A. ONLY
- B. and Containment Isolation Phase A ONLY
- C. Containment Isolation Phase A, and Main Steam Line Isolation ONLY
- D. Containment Isolation Phase A, Main Steam Line Isolation, and Containment Isolation Phase B

Proposed Answer: C. Containment Isolation Phase A, and Main Steam Line Isolation ONLY

Explanation (Optional):

Containment pressure >3.5 psig, SI actuates. CISA also actuates when SI actuates. MSLI actuates (High 2) at 17 psig. CSAS and CISB will not actuate until Cnmt pressure reached 27 psig

Technical Reference(s): E-0, Att F (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1303200 R7 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	011 K5.12	
	Importance Rating	2.7	

Knowledge of the operational implications of the following concepts as they apply to the PZR LCS Criteria and purpose of PZR level program

Proposed Question: Common 29

Which ONE (1) of the following describes the purpose of the pressurizer level program?

Pressurizer level is ramped up from approximately...

- A. 27% at no load  $T_{avg}$  to maintain a constant mass in the RCS as  $T_{avg}$  is increased.
- B. 27% at no load  $T_{avg}$  to maintain a constant volume in the RCS as  $T_{avg}$  is increased.
- C. 17% at no load  $T_{avg}$  to maintain a constant mass in the RCS as  $T_{avg}$  is increased.
- D. 17% at no load  $T_{avg}$  to maintain a constant volume in the RCS as  $T_{avg}$  is increased.

Proposed Answer: A. 27% at no load  $T_{avg}$  to maintain a constant mass in the RCS as  $T_{avg}$  is increased.

Explanation (Optional):

- A. Correct  
B. Incorrect. Setpoint is correct, but reason is not  
C. Incorrect. Setpoint is incorrect, Low Level Heater Cutout setpoint used  
D. Incorrect. Reason and setpoint are incorrect, Low Level Heater Cutout setpoint used

Technical Reference(s): LP 1301000 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1301000 R1 (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 3  
55.43 \_\_\_\_\_

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>015 K2.01</u>	<u>          </u>
	Importance Rating	<u>3.3</u>	<u>          </u>

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

Proposed Question: Common 30

The following conditions exist:

- A plant startup is in progress.
- Reactor power is currently 7%.
- A loss of Instrument Bus NN01 occurs.

Which ONE (1) of the following describes the effect on the plant?

- A. Source Range instruments energize prematurely.
- B. Reactor trips due to loss of one Source Range instrument.
- C. Reactor trips due to loss of one Intermediate Range instrument.
- D. Intermediate Range high flux reactor trip will NOT actuate if required.

Proposed Answer: C. Reactor trips due to loss of one Intermediate Range instrument.

Explanation (Optional):

Source Range is already deenergized for this event. 1 out of 2 logic required for IR trip. Trip bistables deenergize, causing a reactor trip on IR high flux. SR would not energize prematurely, because the remaining IR is indicating properly. IR high flux does trip.

Technical Reference(s): OFN SB-008 Background (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1301501 R10 (As available)

Question Source: Bank # X

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

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

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

10 CFR Part 55 Content: 55.41 6  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>017 K6.01</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the effect of a loss or malfunction of the following ITM system components: Sensors and detectors

Proposed Question: Common 31

The plant is operating at full power when a Loop 1 Wide Range  $T_c$  RTD begins to fail high.

Which ONE (1) of the following describes the effect, if any, on 'B' Train Subcooling Margin Monitor MCB indication?

- A. No effect since Loop 1 RTDs input to Train "A" Subcooling Margin Monitor.
- B. No effect since Loop RTDs do not provide temperature input to the Subcooling Margin Monitors.
- C. Large decrease since the Subcooling Monitor uses the highest reading Wide Range RTD or core exit thermocouple.
- D. Small decrease since the Subcooling Monitor uses the average of the Wide Range RTDs and the core exit thermocouples.

Proposed Answer: C. Large decrease since the Subcooling Monitor uses the highest reading Wide Range RTD or core exit thermocouple.

Explanation (Optional):

Inputs from Loop RTDs and CETs. Highest reading will give lowest subcooling indication. Loop 1 inputs to Train B

Technical Reference(s): LP 1300202 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1300202 R4 (As available)

Question Source: Bank # X (18989)  
Modified Bank #                      (Note changes or attach parent)  
New                     

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 2  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	028 A1.01	
	Importance Rating	3.4	

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the HRPS controls including: Hydrogen Concentration

Proposed Question: Common 32

Given the following conditions:

- A Large Break LOCA has occurred.
- "A" Containment Hydrogen Recombiner is in service.
- "B" Containment Hydrogen Recombiner tripped upon starting, and CANNOT be restarted.

Which ONE (1) of the following describes the effect on the removal of Hydrogen from Containment?

- A. Hydrogen concentration will remain below 4% with only one Recombiner in operation.
- B. Hydrogen concentration will rise above 4% but remain below 13% with only one Recombiner in operation.
- C. Hydrogen concentration will remain below 4% ONLY if Containment Spray is placed in service in addition to the Recombiner.
- D. Hydrogen concentration will remain below 4% ONLY if the Containment Purge System is placed in service in addition to the Recombiner.

Proposed Answer: A. Hydrogen concentration will remain below 4% with only one Recombiner in operation.

Explanation (Optional):

- A. Correct. Either train will meet design function
- B. Incorrect. 4% is the limit. 13% was chosen as the approximate value for explosive mixture
- C. Incorrect. Spray will not be in service at the pressures that H2 recombiners operate at.
- D. Incorrect. Purge system would not be placed in service as a result of a recombinder failure

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

Proposed references to be provided to applicants during examination: None

Learning Objective: 1302800 R5 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 9  
55.43                     

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	029 A3.01	
	Importance Rating	3.8	

Ability to monitor automatic operation of the Containment Purge System including: CPS isolation.

Proposed Question: Common 33

Given the following conditions:

- The plant is in Mode 6.
- S/D Purge is in service.
- During core off-load a fuel assembly is dropped.
- The gas channel for Radiation Monitor GTRE22 alarms HIHI.
- The gas channel for Radiation Monitor GTRE33 alarms HI.

Which ONE (1) of the following describes the response of the Containment Purge System?

- A. Continues to operate normally.
- B. All S/D Purge isolation dampers close.
- C. Only Train 'A' S/D Purge isolation dampers close.
- D. Only Train 'B' S/D Purge isolation dampers close.

Proposed Answer: B. All S/D Purge isolation dampers close.

Explanation (Optional):

- A. Incorrect. HI HI on RE22 **or** RE33 cause purge isolation.
- B. Correct. GTRE22 will provide cross trip and close all dampers.
- C. Incorrect. GTRE22 will provide cross trip and close all dampers.
- D. Incorrect. Even though GTRE33 won't cause CPIS, GTRE22 will still close all dampers.

Technical Reference(s): M-12GT01 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 1302800 R7 (As available)



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	033 A3.02	
	Importance Rating	2.9	

Ability to monitor automatic operation of the Spent Fuel Pool Cooling System including: Spent fuel leak or rupture

Proposed Question: Common 34

Given the following conditions:

- The plant is at 100% power.
- "A" Spent Fuel Cooling Pump and Heat Exchanger are in service.
- Fuel Building Exhaust radiation monitors, GG RE-27 and GG RE-28, indications have been rising and are now alarming.
- All equipment is operating as designed.

Which ONE (1) of the following describes the cause of the indication and the effect on the plant?

- A spent fuel assembly is leaking or ruptured. Fuel Building Isolation will be automatically actuated.
- Spent Fuel Pool level has decreased below the low-low level setpoint. The operating SFP Cooling Pump must be stopped manually to prevent uncovering spent fuel.
- Spent Fuel Pool level has decreased below the low-low level setpoint. Fuel Building Isolation will be automatically actuated and Control Room Ventilation Isolation will be automatically actuated.
- A spent fuel assembly is leaking or ruptured. The operating SFP Cooling Pump must be stopped manually to reduce potential radioactive release due to contamination of the SFP Heat Exchanger.

Proposed Answer: A. A spent fuel assembly is leaking or ruptured. Fuel Building Isolation will be automatically actuated.

Explanation (Optional):

A is correct. The alignment of SFP cooling will not change, but ventilation will change. If level was below the setpoint, then the operating SFP cooling pump would have received a signal to trip. There is no reason to shut the pump off. The design of the SFP will prevent water level from decreasing to the point of uncovering fuel assemblies so low level should not cause an ESFAS actuation.

Technical Reference(s): OFN-SP-010 (Attach if not previously provided)  
USAR 9.1.3

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732400 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 11  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>001 K2.01</u>	<u>          </u>
	Importance Rating	<u>2.8</u>	<u>          </u>

Knowledge of bus power supplies to the following: One line diagram of power supply to M/G sets

Proposed Question: Common 35

Which ONE (1) of the following describes a path of power provided to a Rod Drive MG Set?

- A. PB04 to PG-20
- B. PA01 to PG-19
- C. PA01 to PB03 to PG-20
- D. PA01 to PB03 to PG-19

Proposed Answer: B. PA01 to PG-19

Explanation (Optional):

The 13.8 KV PA busses supply the PG MCCs through a 13.8 KV to 480 V transformer. Each PA bus supplies half of the PG MCCs. PA01 supplies PG-19 and PA02 supplies PG-20. PB03 and PB04 are the busses that supply Non-Safety related pumps (Condensate, Heater Drains)

Technical Reference(s): KD-7496 (Attach if not previously provided)  
1506205

Proposed references to be provided to applicants during examination: None

Learning Objective: 1300100 R3 (As available)

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

Question History: Last NRC Exam

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

10 CFR Part 55 Content: 55.41   6    
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	071 K3.04	
	Importance Rating	2.7	

Knowledge of the effect that a loss or malfunction of the Waste Gas Disposal System will have on the following: Ventilation system

Proposed Question: Common 36

Which ONE (1) of the following will occur if a Decay Tank rupture occurs in the Radwaste Building during a Gaseous Waste Release?

GH RE-10B, Radwaste Building Ventilation Effluent Radiation Monitor indication will...

- A. Remain the same. Waste Gas Compressors STOP on low Waste Gas system pressure.
- B. Remain the same. Gas Decay Tanks to RW HVAC Discharge Valve (HA HCV-14) ISOLATES due to low decay tank discharge header flow.
- C. Rise. Waste Gas Compressors STOP when GH RE-10B goes into HI-HI Radiation Alarm.
- D. Rise. Gas Decay Tanks to RW HVAC Discharge Valve (HA HCV-14) ISOLATES when GH RE-10B goes into HI-HI Radiation Alarm.

Proposed Answer: D. Rise. Gas Decay Tanks to RW HVAC Discharge Valve (HA HCV-14) ISOLATES when GH RE-10B goes into HI-HI Radiation Alarm.

Explanation (Optional):

Only D correct. Only action to occur is HCV-14 isolates. Waste Gas compressors do not operate on radiation and would not be aligned to a decay tank that is being discharged. A and B are plausible because if the radiation monitor was in the decay tank discharge line it would not change indication. In this case, there will be a larger release through the plant vent system that will be reflected in RMS indications and isolation. All Ventilation and area Rad monitors would be affected due to the location of the Decay Tanks (Lower Level corridor) Second half of A is a true statement. Second half of B is a description of what would be performed manually.

Technical Reference(s): M-12HA03, M-12GH02 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1408803 R4 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 11  
55.43                     

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>035 A4.06</u>	<u>          </u>
	Importance Rating	<u>4.5</u>	<u>          </u>

Ability to manually operate and/or monitor in the control room: S/GS isolation on steam leak or tube rupture/leak

Proposed Question: Common 37

Given the following conditions:

- A Steam Generator Tube Leak is in progress on "B" SG.
- Condenser Air Discharge radiation monitor, GE RE-92, has just reached its HI HI ALARM setpoint.

Which ONE (1) of the following describes the plant condition resulting from this alarm?

- A. ONLY the "B" SG Blowdown Isolation Valve, BM HV-2, will automatically close.
- B. ONLY the "B" SG Blowdown Isolation valve, BM HV-2, and "B" SG Blowdown Sample Isolation Valve, BM HV-6, will close.
- C. ALL Blowdown Isolation valves, BM HV-1-4, and Blowdown Sample Isolation valves, BM HV-5-8, will automatically close.
- D. ALL of the SG Blowdown Isolation valves, BM HV-1-4, will close. The Blowdown Sample Isolation valves, BM HV-5-8, will remain open.

Proposed Answer: C. ALL Blowdown Isolation valves, BM HV-1-4, and Blowdown Sample Isolation valves, BM HV-5-8, will automatically close.

Explanation (Optional):

High alarm for RE-92 will initiate Blowdown and Blowdown Sample isolation. The Condenser Air Discharge monitor does not distinguish between affected SGs

Technical Reference(s): OFN SP-010 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 1407300 R5 (As available)

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

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

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

10 CFR Part 55 Content: 55.41 11  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	086 A2.04	
	Importance Rating	3.3	

Ability to (a) predict the impacts of the following malfunctions or operations on the Fire Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure to actuate the FPS when required, resulting in fire damage

Proposed Question: Common 38

Given the following conditions:

- A fire was reported at the Main Transformer 3 minutes ago.
- The reactor has tripped, and the transformer is electrically isolated.
- Fire alarms exist, but no automatic fire protection actuation has occurred.
- The Fire Brigade has been dispatched in accordance with OFN KC-016, FIRE RESPONSE.

Which ONE (1) of the following describes the actions required next to attempt to extinguish the fire?

- A. Activate the local CO2 System and charge fire hoses for direct spray.
- B. Start a Motor Driven Fire Pump and manually initiate the local Main Transformer Wet Pipe sprinkler system.
- C. Start a Motor Driven Fire Pump and manually activate the Transformer Deluge system.
- D. Start the Diesel Driven Fire Pump and manually initiate the local Main Transformer Dry Pipe sprinkler system.

Proposed Answer: C. Start a Motor Driven Fire Pump and manually activate the Transformer Deluge system.

Explanation (Optional):

The Main Transformer has a deluge system that should have activated upon alarm. Manual activation is accomplished by an actuation lever. The system does not have a wet or dry pipe or CO2 protection scheme, and starting the Diesel driven Fire Pump takes place only if the Motor Driven Fire Pump fails to start

Technical Reference(s): OFN KC-016 (Attach if not previously provided)Proposed references to be provided to applicants during examination: NoneLearning Objective: 1732426 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 10  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	007 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.

Proposed Question: Common 39

Which ONE (1) of the following is an Immediate Action that may be required during performance of EMG E-0, REACTOR TRIP OR SAFETY INJECTION?

- A. Insert control rods in MANUAL.
- B. Place EHC Pumps in Pull-To-Lock.
- C. Open BIT Inlet Valves EM HCV-8803A and B.
- D. Ensure AFW flow is greater than 270,000 lbm/hr.

Proposed Answer: B. Place EHC Pumps in Pull-To-Lock.

Explanation (Optional):

A is incorrect. Only manual trip would be attempted, rod insertion is part of FR-S1

B is correct if the turbine will not trip manually

C is incorrect. SI may be initiated but BIT alignment is performed as part of attachment from EOP step 5

D is incorrect because AFW flow is verified in step 6

Technical Reference(s): EMG E-0 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732313 R2 (As available)

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

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

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41   10    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	008 AK3.02	
	Importance Rating	3.6	

Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: Why PORV or code safety exit temperature is below RCS or PZR temperature.

Proposed Question: Common 40

A pressurizer code safety valve has indications of leakage.

The following indications exist:

- Pressurizer pressure is 2220 psig and stable.
- Safety Valve tailpipe temperature indicates 231 degrees F and rising slowly.
- PRT pressure is 6 psig and rising 1 psi every 10 minutes.

Which ONE (1) of the following is the reason for the temperature indication seen downstream of the safety valve?

- A. The leak is too small to overcome ambient heat loss to the containment.
- B. The fluid velocity in the tailpipe results in a loss of energy and lower temperature.
- C. The fluid temperature corresponds to the PRT saturation pressure because minimal energy is lost in a throttling process.
- D. The volume of water in the PRT quenches the superheated vapor downstream of the leaking safety valve.

Proposed Answer: C. The fluid temperature corresponds to the PRT saturation pressure because minimal energy is lost in a throttling process.

Explanation (Optional):

A constant enthalpy process means same BTU/LBM of fluid. Using mollier diagram, go to the new pressure (PRT) directly to the right on a constant enthalpy line. Follow the pressure line up to the saturation curve to determine the temperature of the fluid.

Technical Reference(s): Steam Tables (Attach if not previously provided)  
Thermo

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

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

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

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

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

10 CFR Part 55 Content: 55.41 14  
55.43 \_\_\_\_\_

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	009 EK3.08	
	Importance Rating	3.6	

Knowledge of the reasons for the following responses as they apply to the small break LOCA: PTS limits on RCS pressure and temperature - NC and FC.

Proposed Question: Common 41

Following a Small Break LOCA coincident with loss of Off-Site power, the crew is performing action contained in EMG FR-P1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK.

Which ONE (1) of the following describes the difference in SI termination criteria for EMG FR-P1 as opposed to the criteria in EMG ES-03, SI TERMINATION?

The criteria in EMG FR-P1 is...

- A. less restrictive to allow for a faster reduction in RCS pressure, whether core cooling is by forced or natural circulation.
- B. more restrictive to allow for a more controlled reduction in RCS pressure, because natural circulation is assumed to be the mode of core cooling in FR-P1.
- C. less restrictive because subsequent RCP restart is likely to cause propagation of any existing flaw in the reactor vessel walls.
- D. more restrictive because subsequent RCP restart is likely to cause propagation of any existing flaw in the reactor vessel walls.

Proposed Answer: A less restrictive to allow for a faster reduction in RCS pressure, whether core cooling is by forced or natural circulation.

Explanation (Optional):

The criteria are less restrictive so that SI reduction can aid the RCS pressure reduction, whether or not RCPs are operating. Operating an RCP is conducive to proper mixing of RCS and SI water, which will minimize the likelihood of vessel failure due to PTS. RVLIS level rather than pzs level is used as a measure of inventory. RCP restart will not cause a crack to propagate under any of the conditions analyzed for this procedure. However, propagation of flaws is a major concern in a PTS event.

Technical Reference(s): FR-P1 Basis (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732349 R3 (As available)

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

Question History: Last NRC Exam

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

10 CFR Part 55 Content: 55.41 10  
55.43

Comments:

2002 Salem NRC Editorially Modified

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	011 EA1.11	
	Importance Rating	4.2	

Ability to operate and monitor the following as they apply to a Large Break LOCA: Long-term cooling of core

Proposed Question: Common 42

Given the following conditions:

- A Large Break LOCA has occurred.
- The crew has determined that a transition to EMG ES-13, TRANSFER TO HOT LEG RECIRCULATION, IS REQUIRED.

When the transfer to Hot Leg Recirculation is complete, which ONE (1) of the following describes the ECCS alignment?

- A. ONE Train of RHR and ONE SI aligned to Hot Legs, and ONE Train of RHR and SI Pumps isolated.
- B. BOTH Trains of RHR and SI aligned to Hot Legs. ECCS Pumps operated as necessary to maintain RCS Inventory.
- C. BOTH Trains of RHR aligned to Hot Legs, and BOTH Trains of SI aligned to Cold Legs. ECCS Pumps operated as necessary to maintain RCS Inventory.
- D. ONE Train of ECCS in service with the RHR Pump aligned to the Hot Legs and the SI Pump aligned to Cold Legs. Opposite Train of ECCS is placed in Standby.

Proposed Answer: B. BOTH Trains of RHR and SI aligned to Hot Legs. ECCS Pumps operated as necessary to maintain RCS Inventory.

Explanation (Optional):

Both Red and Yellow Trains are aligned to hot legs with pumps operated to maintain RVLIS based on number of RCPs operating. All of the distractors are plausible because only a limited amount of SI flow is required at this point in the event, and there is flow to both hot and cold legs while this transition is in progress

Technical Reference(s): EMG ES-13 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732323 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 10  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	015 AA1.16	
	Importance Rating	3.2	

Ability to operate and / or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Low power reactor trip block status lights.

Proposed Question: Common 43

Given the following conditions:

- The unit is in Mode 1.
- Status Indicating Panel permissive indication is as follows:
  - P-10 LIT
  - P-7 LIT
  - P-13 EXTINGUISHED
  - P-8 EXTINGUISHED
- A loss of 13.8KV Bus PA01 occurs.
- The plant responded as designed.

Which ONE (1) of the following describes the plant response, and the reason for that response?

A reactor trip will...

- A. occur because of the status of P-7.
- B. occur because of the status of P-13.
- C. NOT occur because of the status of P-10.
- D. NOT occur because of the status of P-8.

Proposed Answer: A. occur because of the status of P-7.

Explanation (Optional):

A is correct because above P-7, Loss of Flow in 2 loops causes a reactor trip. In this case, loss of PA01 causes trip of 2 RCPs. B is incorrect because P-13 being unlit will provide power <10% input to P-7, requiring P-10 to be lit to energize P-7. C is incorrect because P-10 being lit is the actual input to P-7 that caused the trip to be active. D is incorrect because P-8 is the permissive for single loss of loop. With P-8 extinguished, it means that a loss of 1 RCP will NOT cause an automatic trip

Technical Reference(s): USAR Table 7.2-2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1301200 R3 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	022 AA1.08	
	Importance Rating	3.4	

Ability to operate and / or monitor the following as they apply to the Loss of Reactor Coolant Makeup: VCT level.

Proposed Question: Common 44

Given the following conditions:

- The plant is at 100% power.
- All control systems are operating in AUTO.
- The controlling PZR level transmitter develops a reference leg leak.
- NO action is taken.

Which ONE (1) of the following describes the effect on VCT level indication over the next 5 minutes?

- A. INCREASES due to reduced charging flow with constant letdown.
- B. DECREASES due to letdown isolation with increased Charging flow.
- C. REMAINS CONSTANT because there is no actual RCS leakage in progress.
- D. REMAINS CONSTANT because any changes in RCS makeup operation will be identified by a change in pressurizer level.

Proposed Answer: A. INCREASES due to reduced charging flow with constant letdown.

Explanation (Optional):

A is correct because a reference leak will result in a higher than actual pZR level indication. If pZR level is above program, then charging flow will be reduced. With letdown remaining constant and charging reduced, the VCT level will begin to rise. B is incorrect because it is indicative of a variable leg failure. C is incorrect because although there is no RCS leakage, the system thinks that there is an increase in inventory that must be compensated by charging reduction. D is a partially correct statement, but NOT a reason that VCT would remain constant. VCT level change will occur.

Technical Reference(s): Background OFN SB-008 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1300400 R4 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 7  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	025 AA1.23	
	Importance Rating	2.8	

Ability to operate and / or monitor the following as they apply to the Loss of Residual Heat Removal System: RHR heat exchangers.

Proposed Question: Common 45

Given the following conditions:

- The unit is in Mode 5.
- A loss of RHR has occurred.
- The crew is performing the actions of OFN EJ-015, LOSS OF RHR COOLING.
- BOTH RHR Pumps were tripped.
- The crew is preparing to start "A" RHR Pump.

Which ONE (1) of the following describes the required position of RHR Heat Exchanger flow control and bypass flow control valves in accordance with OFN EJ-015?

	<u>Flow Control Valve EJ HIC-606</u>	<u>Bypass Flow Control Valve EJ FK-618</u>
A.	OPEN	OPEN
B.	CLOSED	OPEN
C.	OPEN	CLOSED
D.	CLOSED	CLOSED

Proposed Answer: D. CLOSED, CLOSED

Explanation (Optional):

Both valves will be closed prior to attempting start of a pump, and flow will be initiated slowly if the pump is started

Technical Reference(s): OFN EJ-015 step 10 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732425 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 10  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	027 AK1.01	
	Importance Rating	3.1	

Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions:  
Definition of saturation temperature.

Proposed Question: Common 46

Which ONE (1) of the following Pressurizer Pressure Control System Malfunctions will cause Pressurizer **Saturation** Temperature to RISE?

- A. PZR Spray Valve failed open.
- B. PZR Master Controller setpoint fails LOW.
- C. PZR Master Controller output fails LOW.
- D. PZR Pressure input to Master Controller fails HIGH.

Proposed Answer: C. PZR Master Controller output fails LOW.

Explanation (Optional):

Anything that will raise pressurizer pressure will raise the saturation temperature of the pressurizer. A is wrong because failing a spray valve open will cause pressure to lower. D is incorrect because it will cause a PORV to open, reducing pressure. C is correct because output lowering will cause heaters to turn on to raise pressure. B is incorrect because if the setpoint fails low, the controller will attempt to maintain a lower pressure, which will result in a lower saturation temperature.

Technical Reference(s): OFN SB-008 BD (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732418 R1 (As available)

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

New

X

Question History:

Last NRC Exam

Question Cognitive Level:

Memory or Fundamental Knowledge  
Comprehension or Analysis

X

10 CFR Part 55 Content:

55.41 7

55.43       

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	029 EK3.12	
	Importance Rating	4.4	

Knowledge of the reasons for the following responses as they apply to the ATWS: Actions contained in EOP for ATWS.

Proposed Question: Common 47

Which ONE (1) of the following describes the reason that emergency boration is initiated in EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION - ATWT?

- A. After control rod trip and rod insertion functions, boration is the next most direct manner of adding negative reactivity to the core.
- B. It is the fastest method of adding negative reactivity in the event that an uncontrolled cooldown results from a turbine trip failure.
- C. To provide a method of boron addition at high RCS pressures, helping to avoid unnecessary SI initiation.
- D. It is required because the USAR accident analysis does not take credit for local operator actions in the event of an ATWT.

Proposed Answer: A. After control rod trip and rod insertion functions, boration is the next most direct manner of adding negative reactivity to the core.

Explanation (Optional):

- A. Correct.
- B. Incorrect. The fastest method is to insert rods.
- C. Incorrect. Avoiding SI initiation is not a concern for FR-S1.
- D. Incorrect. Whether or not UFSAR takes credit for local actions has no bearing on why boration is initiated.

Technical Reference(s): FR-S1 Background (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1732339 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 10  
55.43                     

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	040 AA1.07	
	Importance Rating	3.4	

Ability to operate and / or monitor the following as they apply to the Steam Line Rupture: Steam pressures and flow rates via computer, safety parameter display system, and other indications.

Proposed Question: Common 48

The plant tripped from 100% power due to a Main Steam Line Break inside Containment.

ALL of the following indications for the affected SG may be monitored on the Safety Parameter Display System (SPDS) with the EXCEPTION of:

- A. Steam Line Pressure
- B. Steam Flow Rate
- C. Loop Tcold indication
- D. Steam Generator Level

Proposed Answer: B. Steam Flow Rate

Explanation (Optional):

Pressure and Tcold are available, and SG level is an SPDS indication. Steam Flow Rate is not an available SPDS indication

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

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 1408300 R2 (As available)

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

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

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X10 CFR Part 55 Content: 55.41 7  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>056 AA1.07</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>          </u>

Ability to operate and / or monitor the following as they apply to the Loss of Offsite Power: Service water pump.

Proposed Question: Common 49

Given the following conditions:

- A loss of Off-Site Power has occurred.
- All equipment has operated as designed.

Which ONE (1) of the following describes the status of the ESW Pumps 45 seconds after event initiation?

	<u>ESW Pump "A"</u>	<u>ESW Pump "B"</u>
A.	RUNNING	RUNNING
B.	RUNNING	STOPPED
C.	STOPPED	RUNNING
D.	STOPPED	STOPPED

Proposed Answer: A. RUNNING, RUNNING

Explanation (Optional):

Approximately 12 seconds following the LOOP, the EDGs will be up to speed and voltage. The sequencer timer for Train A will then start A ESW Pump in 20 seconds. Train B Sequencer will start B ESW Pump at the 25 second point. Therefore, if all equipment operates as designed, both pumps will be running 37 seconds after initiation.

Technical Reference(s): DWG E-12NF01 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: LP 1408900 R6 (As available)

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

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

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

10 CFR Part 55 Content: 55.41 4  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	058 AA2.03	
	Importance Rating	3.5	

Ability to determine and interpret the following as they apply to the Loss of DC Power: DC loads lost; impact on ability to operate and monitor plant systems.

Proposed Question: Common 50

Given the following conditions:

- The plant is in Mode 3.
- "A" and "B" AFW Pumps are in service feeding all 4 SGs.
- 125 VDC control power to the "B" AFW Pump is lost.

Which ONE (1) of the following describes the effect on the operation of "B" AFW Pump?

- A. Breaker indication in Control room is lost  
Remote breaker control is available  
Pump will trip
- B. Breaker indication in Control room is lost  
Remote breaker control is lost  
Pump remains running
- C. Breaker indication in Control room is available  
Remote breaker control is available  
Pump will trip
- D. Breaker indication in Control room is available  
Remote breaker control is lost  
Pump will remain running

Proposed Answer: B. Breaker indication in Control room is lost  
Remote breaker control is lost  
Pump remains running

Explanation (Optional):

DC Control power provides remote breaker indication and control. Loss of DC control power will not trip the equipment, but it will remain running with no indication or control, and only protection would be motor overcurrent

Technical Reference(s): OFN NK-020, Att F (Attach if not previously provided)Proposed references to be provided to applicants during examination: NoneLearning Objective: 1506300 R1 (As available)

Question Source:	Bank #	<u>X</u>	
	Modified Bank #	<u></u>	(Note changes or attach parent)
	New	<u></u>	

Question History: Last NRC Exam

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

10 CFR Part 55 Content:	55.41	<u>7</u>
	55.43	<u></u>

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	062 AA1.02	
	Importance Rating	3.2	

Ability to operate and / or monitor the following as they apply to the Loss of Nuclear Service Water: Loads on the SWS in the control room.

Proposed Question: Common 51

Given the following conditions:

- A Safety Injection actuation has occurred.
- The current time is 1305
- The 'B' EDG started at 1304
- Bus NB02 is being powered from 'B' EDG
- ESW pump 'B' has failed to automatically start

Which ONE (1) of the following describes the actions required?

- A. Unload and stop 'B' EDG until service water can be supplied to the ESW system.
- B. Immediately press the EMERGENCY STOP pushbuttons for 'B' EDG.
- C. Start the 'B' ESW pump by no later than 1307, or unload the 'B' EDG.
- D. Start the 'B' ESW pump by no later than 1306, or trip 'B' EDG.

Proposed Answer: C. Start the 'B' ESW pump by no later than 1307, or unload the 'B' EDG.

Explanation (Optional):

The EDG may run loaded for 3 minutes, unloaded for 30 minutes. If the ESW Pump cannot be started within 3 minutes, then unload the EDG until the Pump can be started.

Technical Reference(s): OFN EF-033, Caution 1 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732443 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 7  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	065 AA2.06	
	Importance Rating	3.6	

Ability to determine and interpret the following as they apply to the Loss of Instrument Air: When to trip reactor if instrument air pressure is decreasing.

Proposed Question: Common 52

After entering OFN KA-019, LOSS OF INSTRUMENT AIR, the following conditions are noted:

- Instrument Air Pressure 65 psig and decreasing
- All 3 Air Compressors Running
- Steam Generator levels 48% slowly increasing
- Letdown Isolated
- Charging flow 130 gpm and increasing
- RCS Pressure 2290 psig and increasing

Which ONE (1) of the following describes the action required?

- A. Take manual control of SG levels.
- B. Manually maintain PZR level at program.
- C. Bypass the in-service Instrument Air Dryer.
- D. Trip the reactor and enter EMG E-0, REACTOR TRIP OR SAFETY INJECTION

Proposed Answer: D. Trip the reactor and enter EMG E-0, REACTOR TRIP OR SAFETY INJECTION

Explanation (Optional):

OFN-KA-019, step 2 requires reactor trip if plant equipment cannot be controlled. Equipment begins to fail to its safe position at approximately 70 psig. All the other actions may be taken if a reactor trip was not required.

Technical Reference(s): OFN KA-019 Step 2 RNO (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1732429 R3 (As available)

Question Source: Bank # X (13877)  
Modified Bank #                      (Note changes or attach parent)  
New                     

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 7,10  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E04 EA1.2	
	Importance Rating	3.6	

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

Proposed Question: Common 53

Given the following conditions:

- A LOCA outside containment has occurred.
- The crew is performing the actions in EMG C-12, LOCA OUTSIDE CONTAINMENT.

Which ONE of the following indications is used to determine if the leak has been isolated in accordance with EMG C-12?

- A. RCS pressure, because SI flow will repressurize the RCS with the break isolated.
- B. Pressurizer level, because with the break isolated, RCS inventory will rapidly rise.
- C. Safety injection flow, because when the break is isolated, it is the first parameter that will change.
- D. RVLIS indication, because as RCS inventory and pressure rise, vessel head voiding will immediately be reduced.

Proposed Answer: A. RCS pressure, because SI flow will repressurize the RCS with the break isolated.

Explanation (Optional):

A-Correct.

B-Incorrect. RCS inventory will increase, but may not immediately show up on PRZ level

C-Incorrect. SI Flow is a good confirmatory indication when RCS pressure rises, because it will be reduced, but RCS pressure rise is the only immediate indication

D-Incorrect. RVLIS may indicate 100% at the start, so may not provide indication of isolation at all

Technical Reference(s): EMG C-12 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732333 R5 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 5  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E05 EK3.2	
	Importance Rating	3.7	

Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) Normal, abnormal and emergency operating procedures associated with (Loss of Secondary Heat Sink).

Proposed Question: Common 54

Which ONE (1) of the following is the primary reason for stopping all RCP's in EMG FR-H1, LOSS OF SECONDARY HEAT SINK?

- A. This may eliminate the need for a secondary heat sink in the case where a small break LOCA is in progress.
- B. They are secured to reduce the heat input from the RCPs, thereby delaying the need for bleed and feed and gaining time to establish a means of supplying FW to a S/G.
- C. They are secured to prevent the heat added by the RCPs from adversely affecting indications used to determine whether or not RCS bleed and feed will be required.
- D. This will reduce RCS pressure enough to ensure bleed and feed is adequate for RCS cooling requirements.

Proposed Answer: B. They are secured to reduce the heat input from the RCPs, thereby delaying the need for bleed and feed and gaining time to establish a means of supplying FW to a S/G.

Explanation (Optional):

A is incorrect, because heat sink is only NOT required for LBLOCA. B is correct, C is incorrect because although RCPs do affect heat input, they do not affect the indication for determination of bleed and feed requirements. D is incorrect because the action to open PORVs will reduce RCS pressure enough to ensure adequate flow

Technical Reference(s): FR-H1 Background, (Attach if not previously provided)  
WCNOC step 7

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732346 R3 (As available)

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

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

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

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

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E11 EK3.4	
	Importance Rating	3.6	

Knowledge of the reasons for the following responses as they apply to the (Loss of Emergency Coolant Recirculation) RO or SRO function as a within 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.

Proposed Question: Common 55

Which ONE (1) of the following describes the reason and limits required for RCS depressurization IAW EMG C-11, LOSS OF EMERGENCY COOLANT RECIRCULATION?

- A. To minimize RCS leakage, depressurize the RCS until Pressurizer level is > 75% OR RCS Subcooling is between 30 degrees F and 40 degrees F.
- B. To increase SI Injection flow, depressurize the RCS until Pressurizer level is > 90% OR RCS Subcooling is between 20 degrees F and 30 degrees F.
- C. To ensure SI Accumulator Injection, depressurize the RCS until Pressurizer level is > 75% OR RCS Subcooling is between 30 degrees F and 40 degrees F.
- D. To allow RHR to be placed in service, depressurize the RCS until Pressurizer level is > 90% OR RCS Subcooling is between 20 degrees F and 30 degrees F.

Proposed Answer: A. To minimize RCS leakage, depressurize the RCS until Pressurizer level is > 75% OR RCS Subcooling is between 30 degrees F and 40 degrees F.

Explanation (Optional):

- A. Correct. The depressurization is performed to decrease leakage, therefore decreasing makeup requirements.
- B. Incorrect. SI injection flow may not increase because there may be no water source.
- C. Incorrect. Setup for accumulator injection is performed later in the procedure after SG depressurization.
- D. Incorrect. RHR will not be placed in service until after the cooldown and depressurization are performed, later in the procedure.

Technical Reference(s): EMG C-11 and background, (Attach if not previously provided)  
Step 39

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732332 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 10  
55.43                     

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E12 EK3.1	
	Importance Rating	3.5	

Knowledge of the reasons for the following responses as they apply to the (Uncontrolled Depressurization of all Steam Generators) Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

Proposed Question: Common 56

Given the following conditions:

- Following an accident, EMG C-21, "UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS," is being performed.
- The operators have reduced AFW flow to all steam generators (SG) to minimum as they continue attempts to isolate the SGs.

Which ONE (1) of the following describes the expected plant response to the AFW flow reduction and what actions are to be taken as SG pressures decrease?

- A. RCS hot leg temperatures will eventually begin to increase and the crew will then transition to EMG ES-03, "SAFETY INJECTION TERMINATION"
- B. RCS hot leg temperatures will eventually begin to increase and the crew will then increase AFW flow while continuing in EMG C-21, "UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS."
- C. The SGs will eventually become completely depressurized and the crew will then transition to EMG E-2, "FAULTED STEAM GENERATOR ISOLATION."
- D. The SGs will eventually become completely depressurized and the crew will then transition to EMG ES-03, "SAFETY INJECTION TERMINATION."

Proposed Answer: B RCS hot leg temperatures will eventually begin to increase and the crew will then increase AFW flow while continuing in EMG C-21, "UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS."

Explanation (Optional):

When AFW flow is reduced, eventually hot leg temperatures will rise when SG inventory is depleted. The purpose of minimizing AFW flow is to minimize cooldown and inventory loss. The SGs depressurize as long as they are faulted, but transition to E-2 is only performed when 1 SG repressurizes, and ES-03 is only performed if AFW flow or SG inventory is available, and would be performed from E-2 after transition from C-21.

Technical Reference(s): EMG C-21 bkgrd, Step 5 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732334 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 X  
55.43                     

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	024 AA1.07	
	Importance Rating	3.3	

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

Proposed Question: Common 57

Given the following conditions:

- An ATWT has occurred.
- The crew is performing the actions in EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWT.
- The Reactor Operator has started an emergency boration.
- 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 (1) of the following describes the plant response to initiation of the boration?

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

Explanation (Optional):

- A. Correct. The BAT will supplying 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): EMG FR-S1, Step 5 (Attach if not previously provided)

\_\_\_\_\_  
\_\_\_\_\_

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1300400 R12 (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 X

10 CFR Part 55 Content: 55.41 6  
55.43 \_\_\_\_\_

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	037 AK1.02	
	Importance Rating	3.5	

Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak: Leak rate vs. pressure drop.

Proposed Question: Common 58

Given the following conditions:

- Chemistry has reported a 2 GPM Steam Generator Tube Leak.
- A Plant Shutdown has been commenced.

Assuming the size of the flaw remains constant, which ONE (1) of the following describes the actual RCS leak rate as power is changed from 100% to 20%?

- A. Decrease because primary to secondary pressure difference is reduced.
- B. Increase because due to improving condenser vacuum as power is changed.
- C. Remain the same because the flaw size has not changed.
- D. Cannot be determined because RCS activity will change due to iodine spiking.

Proposed Answer: A. Decrease because primary to secondary pressure difference is reduced.

Explanation (Optional):

B is incorrect because leak rate is proportional to the DP across the flaw. For a constant flaw size, RCS pressure remains constant, secondary pressure rises as power is reduced, which lowers the DP. C is incorrect because flaw size remaining constant would only allow calculation of actual size of leak rate change. D is incorrect because even though the calculation based on activity may be inaccurate, leak size can still be determined by other means

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

Proposed references to be provided to applicants during examination: None

Learning Objective: 1610722 R10 (As available)

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

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

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

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

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>059 AA2.06</u>	<u>          </u>
	Importance Rating	<u>3.5</u>	<u>          </u>

Ability to determine and interpret the following as they apply to the Accidental Liquid Radwaste Release: That the flow rate of the liquid being released is less than or equal to that specified on the release permit.

Proposed Question: Common 59

Which ONE (1) of the following describes how the discharge flow rate for a Monitor Tank Liquid Waste Release is controlled?

- A. Flow Rate is set in the Radwaste Control Room to a value at or below release permit requirements.
- B. Flow Rate is set at the pump discharge to a value at or below release permit requirements.
- C. Discharge piping is sized to prevent an inadvertent release at a rate higher than that specified on release permits.
- D. Flow Rate is set at a fixed value. The activity of the tank contents determines the required dilution flow to ensure the radioactive release remains within limits.

Proposed Answer: B. Flow Rate is set at the pump discharge to a value at or below release permit requirements.

Explanation (Optional):

Pump discharge valve is throttled to ensure flow rate is within requirements to prevent inadvertent release

Technical Reference(s): SYS HB-130 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1406904 R8 (As available)

Question Source: Bank #

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New X

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

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41 13  
55.43 \_\_\_\_\_

Comments:

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

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

Proposed Question: Common 60

Which ONE (1) of the following describes the methods available to determine the operability of Area Radiation Monitors in the Radwaste Building during a Decay Tank release?

- A. Local observation of FAIL status ONLY. ALERT and HIGH alarm setpoints are determined locally at the radiation monitor.
- B. Local observation of FAIL status ONLY. ALERT and HIGH alarm setpoints may be determined in the control room.
- C. FAIL status is indicated by presence of a control room alarm and indication. ALERT and HIGH setpoints may be determined in the control room.
- D. FAIL status is indicated by a light on the control room indication module. ALERT and HIGH setpoints are determined locally at the radiation monitor

Proposed Answer: C. FAIL status is indicated by presence of a control room alarm and indication. ALERT and HIGH setpoints may be determined in the control room.

Explanation (Optional):

Failure is indicated by annunciation when count rate falls below a minimum for a period of time. Then the monitor with the failure can be determined in the control room. Pressing a toggle for either alert or high radiation will indicate the setpoint of each of those.

Technical Reference(s): LP 1407200 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1407200 R3 (As available)

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

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

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

10 CFR Part 55 Content: 55.41 11  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>061 AK2.01</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>          </u>

Knowledge of the interrelations between the Area Radiation Monitoring (ARM) System Alarms and the following: Detectors at each ARM system location.

Proposed Question: Common 61

All of the following Area Radiation Monitors provide input to the MCB annunciators with the EXCEPTION of:

- A. Technical Support Center
- B. 2047' Control Building, behind Control Room
- C. Hot Machine Shop
- D. 2000' Radwaste Truck Bay

Proposed Answer: A. Technical Support Center

Explanation (Optional):

All ARMs alarm at MCB with exception of TSC and EOF. Other distractors are plausible because they are located in areas where radiation is typically not expected and not present, or outside of the main power block.

Technical Reference(s): LP 1407200 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1407200 R2 (As available)

Question Source: Bank #           

Modified Bank #            (Note changes or attach parent)

New X

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

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41   11    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	068 AK2.07	
	Importance Rating	3.3	

Knowledge of the interrelations between the Control Room Evacuation and the following: EDG

Proposed Question: Common 62

The Control Room has been evacuated in accordance with OFN RP-017, CONTROL ROOM EVACUATION.

The RO is performing Attachment C, REACTOR OPERATOR ACTIONS.

Which ONE (1) of the following will describe the status of the EDGs when Attachment C is complete?

- A. Both "A" EDG and "B" EDG in Standby.
- B. "A" EDG running loaded. "B" EDG in Standby.
- C. "B" EDG running loaded. "A" EDG in Standby.
- C. Both "A" and "B" EDG running loaded.

Proposed Answer: C. "B" EDG running loaded. "A" EDG in Standby.

Explanation (Optional):

If RP-017 has been entered, the "B" Train is protected for Appendix R purposes. Attachment C disconnects EDG "B" and starts and loads it in case other electrical distribution controls are disabled by the fire

Technical Reference(s): OFN RP-017, Attachment C (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732427 R3 (As available)

Question Source: Bank #

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New

X

Question History:

Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
Comprehension or AnalysisX  
\_\_\_\_\_

10 CFR Part 55 Content:

55.41 7

55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	069 AA2.02	
	Importance Rating	3.9	

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

Proposed Question: Common 63

Given the following conditions:

- A LOCA has occurred.
- Reactor trip and safety injection have actuated.
- RCS pressure is 1100 psig and decreasing.
- Containment pressure is 11 psig and increasing.

For the current plant conditions, which ONE (1) of the following valves must be CLOSED if it is found in the OPEN position?

- A. MSIV 'A'
- B. KA HV-29, Instrument Air to Containment
- C. BG FCV-121, Charging Flow Control Valve
- D. EG HV-62, CCW from RCS Inner Containment Isolation Valve

Proposed Answer: B. KA HV-29, Instrument Air to Containment

Explanation (Optional):

A Incorrect. MSIV Closure only takes place on steam line break of Ctmt High 2 (17 psig)

B Correct. Valve closes on CISA (3.5 psig)

C Incorrect. Valve is isolated by MV 8105 and 8106 on SI signal, but position of valve is unimportant

D Incorrect. Valve receives close signal on High 3 (27 psig)

Technical Reference(s): EMG E-0, Att B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732313 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 7  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	E09 G2.1.33	
	Importance Rating	3.4	

Conduct of Operations: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Proposed Question: Common 64

Given the following conditions:

- The reactor has tripped due to a loss of off-site power.
- A Natural Circulation cooldown is in progress in accordance with the appropriate EMG ES-04, NATURAL CIRCULATION COOLDOWN.

The following table is a plot of the cooldown:

<u>TIME</u>	<u>RCS T<sub>COLD</sub></u>
0800	547°F
0815	523°F
0830	499°F
0845	473°F
0900	449°F
0915	425°F
0930	398°F

Determine whether Tech Spec RCS Cooldown rate limits were exceeded, and if so, at what time were they first exceeded?

- A. Exceeded at 0900.
- B. Exceeded at 0915.
- C. Exceeded at 0930.
- D. Limits were not exceeded.

Proposed Answer: C. Exceeded at 0930.

Explanation (Optional):

- A. Incorrect. 98 deg F in 1 hour, but greater than 50 required by the procedure
- B. Incorrect. 98 deg F in 1 hour, but greater than 50 required by procedure
- C. Correct.
- D. Incorrect. Limits were exceeded at 0930 because c/d rate was 101 deg F for that hour

Technical Reference(s): PTLR 2.1.1.b (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732701 R1 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 10  
55.43 1,2

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	E14 EK3.4	
	Importance Rating	3.3	

Knowledge of the reasons for the following responses as they apply to the (High Containment Pressure) RO or SRO function within 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.

Proposed Question: Common 65

Given the following conditions:

- A LOCA has occurred.
- The crew was required to perform EMG C-11, LOSS OF EMERGENCY COOLANT RECIRCULATION.
- The crew is now entering EMG FR-Z1, RESPONSE TO HIGH CONTAINMENT PRESSURE.
- Containment pressure is 35 psig and STABLE.
- BOTH Containment Spray Pumps were STOPPED in EMG C-11.

Which ONE (1) of the following describes the actions required and the reason for the current strategy for reducing Containment Pressure?

- A. START both Containment Spray Pumps in accordance with FR-Z1. RED CSF conditions take precedence over EMG C-11 actions.
- B. OPERATE Containment Spray Pumps in accordance with the guidance in EMG C-11, as directed by FR-Z1. Conservation of RWST inventory takes precedence over Containment heat removal concerns.
- C. Perform ONLY the FR-Z1 actions that do NOT conflict with or undo the action taken in EMG C-11. Two Containment Fan Coolers will provide adequate depressurization to meet the Containment Safety Function requirements.
- D. Do NOT perform actions of FR-Z1 until the RWST is refilled and the Containment Spray Pumps may be restarted. Ensure all other automatic actions related to containment isolation have occurred as required to ensure maintenance of minimum safety function.

Proposed Answer: B. OPERATE Containment Spray Pumps in accordance with the guidance in EMG C-11, as directed by FR-Z1. Conservation of RWST inventory takes precedence over Containment heat

removal concerns.

Explanation (Optional):

A. Incorrect. FR-Z1 Step 3 says operate IAW C-11.

B. Correct.

C. Incorrect. First part is true, but 2 Containment Coolers will NOT meet safety function.

D. Incorrect. No restriction on RWST level. Z1 actions should be performed regardless of CS availability

Technical Reference(s): EMG FR-Z1, Step 3.b RNO (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732350 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 10  
55.43                     

Comments:  
WTSI Bank

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

Ability to make accurate, clear and concise verbal reports.

Proposed Question: Common 66

In accordance with AI 21-100, OPERATIONS GUIDANCE AND EXPECTATIONS, 3 way communications are required for all of the following circumstances with the EXCEPTION of...

- A. reporting performance of EMG Immediate Actions
- B. acknowledgement of information provided by a crew brief
- C. telephone or radio communication with other work groups outside of Operations Dept.
- D. when the Control Room Supervisor or Shift Manager directly observes a component manipulation

Proposed Answer: B. acknowledgement of information provided by a crew brief

Explanation (Optional):

AI 21-100 requires 3 way communications for all evolutions with the exception of acknowledgement of crew briefs.

Technical Reference(s): AI 21-100 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1733211 R5 (As available)

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

Question History: Last NRC Exam           

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

10 CFR Part 55 Content: 55.41 10  
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	1	
	K/A #	G2.1.32	
	Importance Rating	3.4	

Ability to explain and apply all system limits and precautions.

Proposed Question: Common 67

Given the following conditions:

- A plant cooldown is in progress from Hot Zero Power to 200 deg F in accordance with GEN 00-006, HOT STANDBY TO COLD SHUTDOWN.

Which ONE (1) of the following actions will prevent inadvertent SI actuation during the cooldown?

- A. Maintain SG pressure below 600 psig when PZR pressure is below P-11.
- B. Block Low Steam Line Pressure SI prior to PZR pressure going below P-11.
- C. Maintain RCS pressure below 1920 psig after Low Steam Line Pressure SI has been blocked.
- D. Ensure that SG pressure changes do not exceed the maximum rate for SI actuation prior to RCS pressure going below P-11.

Proposed Answer: C. Maintain RCS pressure below 1920 psig after Low Steam Line Pressure SI has been blocked.

Explanation (Optional):

B is incorrect because above P-11, block is not permitted. When block is performed, High Rate SI is substituted. D is incorrect because High rate is not active until Low Steam Pressure is blocked below P-11. C is correct. If PZR pressure goes above P-11 it will automatically unblock Low Steam Pressure SI. If Steam Pressure is below the setpoint, actuation will occur. A is incorrect because although this action is performed, it does not prevent SI on high rate

Technical Reference(s): GEN 00-006, precaution 4.8 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732106 R5 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>G2.1.22</u>	<u>          </u>
	Importance Rating	<u>2.8</u>	<u>          </u>

Ability to determine Mode of Operation.

Proposed Question: Common 68

What MODE of operation would the Unit be in if average Reactor Coolant temperature is 300°F, and Shutdown Bank "B" is being withdrawn for testing?

- A. Mode 2 – Startup
- B. Mode 3 – Hot Standby
- C. Mode 4 – Hot Shutdown
- D. Mode 5 – Cold Shutdown

Proposed Answer: C. Mode 4 – Hot Shutdown

Explanation (Optional):

- A. Incorrect. Temperature would be above 350 and Control banks off bottom
- B. Incorrect. Temperature would be above 350
- C. Correct.
- D. Incorrect. Temperature must be less than 200 for Mode 5

Technical Reference(s): TS section 1, table 1.1-1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1732701 R1 (As available)

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

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

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	2	
	K/A #	G2.2.34	
	Importance Rating	2.8	

Knowledge of the process for determining the internal and external effects on core reactivity.

Proposed Question: Common 69

Given the following conditions:

- A reactor startup is being performed 20 hours after a trip from 100% power.
- Estimated Critical Rod Position is Bank D at 60 steps.
- Criticality is predicted in 5 hours.

If the startup were to proceed 45 minutes later than scheduled, what is the effect on the 1/M plot data taken during the startup?

1/M plot will....

- A. accurately predict criticality at a lower rod position
- B. accurately predict criticality at a higher rod position
- C. inaccurately predict criticality in a conservative direction
- D. inaccurately predict criticality in a non-conservative direction

Proposed Answer: A. accurately predict criticality at a lower rod position

Explanation (Optional):

- A. Correct.
- B. Incorrect. Would predict at a lower rod position, because 1 additional hour of Xenon removal adds positive reactivity, requiring less positive reactivity from rods for criticality
- C. Incorrect. 1/M should always be accurate. ECP may be inaccurate
- D. Incorrect. 1/M should always be accurate

Technical Reference(s): Xenon Curves (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1732103 R5 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 X  
55.43                     

Comments:  
WTSI Bank



Learning Objective: 1300100 R8 (As available)

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

Question History: Last NRC Exam 2001  
WCNOC  
R71  
\_\_\_\_\_

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	3	
	K/A #	G2.3.10	
	Importance Rating	2.9	

Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.

Proposed Question: Common 71

Given the following conditions:

- A rapid load reduction from 100% power to 65% power was performed approximately 3 hours ago.
- The Letdown Line Radiation Monitor, SJ RE-01, is in alarm.
- Chemistry confirms RCS I-131 activity exceeds maximum Technical Specification limits.
- The Shift Manager directs a plant shutdown be performed.

Which ONE (1) of the following actions is subsequently performed to limit the release of radioactivity?

- A. MSIVs are closed.
- B. RCS is cooled down below 500°F.
- C. SG atmospheric dump valve setpoints are raised.
- D. Maximum condensate demineralizers are placed in service.

Proposed Answer: B. RCS is cooled down below 500°F.

Explanation (Optional):

- A. Incorrect. MSIV closure would not stop release through MSSV
- B. Correct. <500 will make saturation pressure below SV lift setpoints
- C. Incorrect. Would not stop release through MSSV
- D. Incorrect. Will minimize secondary contamination, but will not stop release through MSSV

Technical Reference(s): TS 3.4.16 bases (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732701 R1 (As available)

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

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

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

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

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>3</u>	<u>          </u>
	K/A #	<u>G2.3.2</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>          </u>

Knowledge of facility ALARA program.

Proposed Question: Common 72

A job must be performed under the following conditions:

- Dose rate at job location is 90 mrem/hr.
- Airborne Radioactivity Area from particulates due to weld grinding:
  - Internal dose if respirator is worn is 0 mrem.
  - Internal dose if **no** respirator is worn is 82 mrem.
- Time to complete job while wearing a respirator is 3.5 hours.
- Time to complete job **without** wearing a respirator is 2.75 hours.

Which ONE (1) of the following describes whether a respirator will be worn, and why?

- A. No, wearing a respirator will raise total exposure.
- B. Yes, wearing a respirator will lower total exposure.
- C. No, wearing a respirator will make no difference to the total exposure.
- D. Yes, a respirator must be worn anytime airborne radiation is present.

Proposed Answer: B. Yes, wearing a respirator will lower total exposure.

Explanation (Optional):

Without respirator: Total dose = 90 mrem/hr x 2.75 hours + 82 mrem = 329.5 mrem.

With respirator: Total dose = 90 mrem/hr x 3.5 hours = 315 mrem

Technical Reference(s): AP 25A-401 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1733204 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41 4  
55.43                     

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	4	
	K/A #	G2.4.21	
	Importance Rating	3.7	

Knowledge of the parameters and logic used to assess the status of safety functions including: 1 Reactivity control 2. Core cooling and heat removal 3. Reactor coolant system integrity 4. Containment conditions 5. Radioactivity release control.

Proposed Question: Common 73

Given the following conditions:

- Small Break LOCA IN PROGRESS
- RCS pressure 1450 psig
- Core Exit TC's 678°F
- Loop Tcolds 575°F
- RCP's All OFF
- AFW flow 150,000 lbm/hr
- Rod Bottom Lights All LIT
- IR SUR +.1DPM
- RVLIS NC range 55%
- S/G NR levels 0% ALL

Which ONE (1) of the following correctly describes the Critical Safety Function Status that must be addressed first?

- A. YELLOW condition on Subcriticality
- B. ORANGE condition on Core Cooling
- C. RED condition on Heat Sink
- D. ORANGE condition on Integrity

Proposed Answer: C. RED condition on Heat Sink

Explanation (Optional):

Heat Sink is RED because SG levels are below minimum, with AFW flow below minimum. Red conditions are addressed before any other condition. Subcriticality and Core Cooling are higher priority safety functions, but their status trees are at a lower priority severity. Integrity is not Orange, but the distractor is plausible because integrity concerns are associated with SBLOCA and RCS pressure remaining high. In this case, RCS temperature is too high for Integrity to be a concern.

Technical Reference(s): CSF STs (Heat Sink) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732338 R2 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # X 13955 (Note changes or attach parent)  
New \_\_\_\_\_

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>4</u>	<u>          </u>
	K/A #	<u>G2.4.34</u>	<u>          </u>
	Importance Rating	<u>3.8</u>	<u>          </u>

Knowledge of RO tasks performed outside the main control room during emergency operations including system geography and system implications.

Proposed Question: Common 74

A Control Room evacuation is required in accordance with OFN RP-013, CONTROL ROOM NOT HABITABLE.

Which ONE (1) of the following is the responsibility of the Balance of Plant Operator (BOP)?

- A. Go to the Auxiliary Shutdown Panel to transfer AFW and ARV controls to LOCAL
- B. Go to the Technical Support Center to monitor an NPIS computer to assist in maintaining stable plant conditions
- C. Proceed to NB02 Switchgear Room to locally operate EDGs and other equipment if required
- D. Go to Reactor Trip Switchgear Room to locally operate Reactor Trip and Bypass Breakers if required

Proposed Answer: B. Go to the Technical Support Center to monitor an NPIS computer to assist in maintaining stable plant conditions

Explanation (Optional):

A is incorrect. CRS performs action

B is correct. BOP performs action

C is incorrect. RO performs action

D is incorrect. Performed by Aux Building Operator

Technical Reference(s): OFN-RP-013, Step 9.b (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732423 R3 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #	4	
	K/A #	G2.4.2	
	Importance Rating	3.9	

Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.

Proposed Question: Common 75

Given the following conditions:

- The reactor has tripped due to a Loss of Coolant Accident (LOCA).
- All Vital and Non-vital AC and DC power is available.
- The crew is currently performing steps in procedure EMG E-0, REACTOR TRIP OR SAFETY INJECTION.
- Pressurizer Pressure is currently reading 1820 psig and dropping.
- Low Press SI Annunciator alarms.
- The Reactor Operator notes that only the "A" Train components of Safety Injection (SI) are actuating.

Which ONE (1) of the following actions is required?

- A. Continue with the procedure in progress, since only one Train is required.
- B. Allow more time for the "B" Train Safety Injection to complete actuation.
- C. Manually line-up and start Safety Injection components on the "B" Train.
- D. Manually initiate a Safety Injection on the "B" Train from the Control Board.

Proposed Answer: D. Manually initiate a Safety Injection on the "B" Train from the Control Board.

Explanation (Optional):

The Operator expectation is based on the fact that you can waste significant time and resources by trying to diagnose whether or not to initiate the other train or to line it up manually. Therefore, (Ans. A) one train should not be relied upon if two are available. Ans. B is incorrect, since enough time has elapsed for the SIS to have actuated. Ans. C is incorrect, because it takes too long to manually line up a Train. Ans. D is correct because this is an expectation of Operators.

Technical Reference(s): AP 15C-003, Att C (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: LO1733203 R3 (As available)

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

Question History: Last NRC Exam 2001 NRC  
R73

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

10 CFR Part 55 Content: 55.41 7  
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	008 G2.4.30	
	Importance Rating	_____	3.6

Emergency Procedures / Plan Knowledge of which events related to system operations/status should be reported to outside agencies

Proposed Question: SRO 76

Which ONE (1) of the following events would require a 1 Hour notification to the NRC in accordance with 10CFR50.72?

- A. Initiation of a Licensee Event Report (LER)
- B. Initiation of a plant shutdown in accordance with T.S. 3.0.3
- C. Confirmed violation of Fitness for Duty requirements
- D. PZR Safety Valve failure resulting in SI actuation

Proposed Answer: D. PZR Safety Valve failure resulting in SI actuation

Explanation (Optional):

- A. Incorrect. 4 Hours
- B. Incorrect. 4 Hours
- C. Incorrect. 4 Hours if Licensed Operator
- D. Correct. SI Actuation indicates an RCS leak, requiring declaration of ALERT and 1 hour notification

Technical Reference(s): 10CFR50.72 (Attach if not previously provided)  
APF 06-002-01 EAL 3

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1610733 Obj 4 (As available)

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

New

Question History:

Last NRC Exam

Question Cognitive Level:

Memory or Fundamental Knowledge  
Comprehension or Analysis

X

10 CFR Part 55 Content:

55.41

55.43

5

Comments:

WTSI Bank

10CFR55.43(b) item 5 because the SRO must assess the event and reportability, and determine the correct time to meet the NRC commitment.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	015 AA2.08	_____
	Importance Rating	_____	3.5

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): When to secure RCPs on high bearing temperature.

Proposed Question: SRO 77

Given the following conditions:

- The unit is at 55% power.
- The crew is performing OFN BB-005, RCP MALFUNCTIONS, due to rising temperatures on RCP "A".
- The following conditions exist for RCP "A":
  - Thrust Bearing Upper 196 deg F
  - Radial Bearing Upper 189 deg F
  - Thrust Bearing Lower 189 deg F
  - Radial Bearing Lower 192 deg F
  - Pump Radial Bearing 218 deg F
  - Motor Stator Winding 292 deg F

Which ONE (1) of the following limits is being exceeded, and which ONE (1) of the following actions will be directed?

- A. Motor Stator Winding temperature is exceeding allowable limits. Trip the reactor, enter EMG E-0, REACTOR TRIP OF SAFETY INJECTION, and trip RCP "A".
- B. Radial Bearing Lower temperature is exceeding allowable limits. Reduce power to less than the P-8 setpoint and trip RCP "A" in accordance with OFN BB-005.
- C. Thrust Bearing Upper temperature is exceeding allowable limits. Trip the reactor, enter EMG E-0, REACTOR TRIP OF SAFETY INJECTION, and trip RCP "A".
- D. Pump Radial Bearing temperature is exceeding allowable limits. Reduce power to less than the P-8 setpoint and trip RCP "A" in accordance with OFN BB-005.

Proposed Answer: C. Thrust Bearing Upper temperature is exceeding allowable limits. Trip the reactor, enter EMG E-0, REACTOR TRIP OF SAFETY INJECTION, and trip RCP "A".

## Explanation (Optional):

If power is above 48% and a limit is exceeded, the reactor will be tripped IAW OFN BB-005, Att B. The limit for Thrust or motor radial bearings is 195 deg F. The limit for the pump radial bearing is 230 deg F and the limit for the motor stator winding is 299 deg F.

Technical Reference(s): OFN BB-005, Step 2.b RNO (Attach if not previously provided)  
Att B step 1

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732415 R3 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	057 G2.2.27	
	Importance Rating	_____	3.5

Equipment Control Knowledge of the refueling process.

Proposed Question: SRO 78

Given the following conditions:

- The unit is in Mode 6.
- Core Alterations are in progress
- A loss of Instrument Bus NN02 occurs.

In accordance with Technical Specifications, which ONE (1) of the following describes the action required with respect to Core Alterations?

- A. Immediately suspend core alterations and any evolution that would dilute RCS boron concentration to below TS requirements.
- B. Core Alterations may continue if the Source Range Audio Count Rate is selected to an operable channel.
- C. Core Alterations may continue. Any evolution that would dilute RCS boron concentration to below TS requirements is prohibited.
- D. Immediately suspend Core Alterations. Ensure at least 1 Source Range NI is operable prior to performing any evolution that would dilute RCS boron concentration.

Proposed Answer: A. Immediately suspend core alterations and any evolution that would dilute RCS boron concentration to below TS requirements.

Explanation (Optional):

TS 3.9.3 requires 2 operable Source Range Monitors for core alterations and any evolution that would reduce boron concentration. B is incorrect because although the audio count rate would be selected to an operable channel, core alterations must be stopped. C is incorrect because core alts must cease, although the second half of the item is correct. D is incorrect, although the first half is correct. 2 SR NIs must be operable for dilution

Technical Reference(s): TS 3.9.3 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732701 R1 (As available)

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

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

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

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 2,7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	062 AA2.03	
	Importance Rating	_____	2.9

Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The valve lineups necessary to restart the SWS while bypassing the portion of the system causing the abnormal condition.

Proposed Question: SRO 79

Given the following conditions:

- A loss of off-site power has occurred.
- ESW has isolated from Service Water.
- BOTH ESW pumps are running.
- ESW Pump A discharge pressure is 100 psig.
- ESW Pump A flow is 9E6 lbm/hr.
- ESW Pump B discharge pressure is 145 psig.
- ESW Pump B flow is 6E6 lbm/hr.

Which ONE (1) of the following conditions exists, and which of the following actions is required?

- ESW Train A has a leak. Isolate the leak or place necessary loads on ESW Train B in accordance with OFN EF-033, LOSS OF ESSENTIAL SERVICE WATER.
- ESW Train B has a blockage or valve misalignment. Verify valve alignment and component temperatures normal or place necessary loads on Train A in accordance with OFN EF-033, LOSS OF ESSENTIAL SERVICE WATER.
- ESW Train A has a leak. Transfer loads to Service Water in accordance with OFN EF-033, Attachment A, Transferring ESW supply to Service Water.
- ESW Train B has a blockage or valve misalignment. Transfer loads to Service Water in accordance with OFN EF-033, Attachment A, Transferring ESW supply to Service Water.

Proposed Answer: A. ESW Train A has a leak. Isolate the leak or place necessary loads on ESW Train B in accordance with OFN EF-033, LOSS OF ESSENTIAL SERVICE WATER.

## Explanation (Optional):

ESW discharge pressure is normally > 137 psig. Service Water pressure is normally >80 psig. Maximum flow is less than 8E6 lbm/hr. Therefore, the train with the low pressure and high flow has the problem. B and D are plausible because the pressure would be normal for Service Water. C is plausible because it is action that would be taken if Service Water was available (LOOP)

Technical Reference(s): OFN EF-033, Steps 7-8 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732433 R3 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	E05 EA2.2	_____
	Importance Rating	_____	4.3

Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: SRO 80

Given the following conditions:

- Reactor trip and safety injection have occurred.
- The crew has entered EMG FR-H1, RESPONSE TO LOSS OF SECONDARY HEAT SINK on a RED condition for the Heat Sink CSF Status Tree.
  - RCS pressure - 1600 psig.
  - SG pressures - 1040 psig in all SGs.
  - A, B, and D SG wide range levels are 25% and slowly trending down.
  - C SG wide range level is 30% and slowly trending down.
  - Total AFW flow is 0 gpm.

Which ONE (1) of the following actions is required?

- A. Initiate secondary depressurization to establish Condensate flow in accordance with EMG FR-H1.
- B. Exit EMG FR-H1 and enter EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
- C. Trip all RCPs and initiate Bleed and Feed in accordance with EMG FR-H1
- D. Raise the setpoint of C SG ARV to conserve SG inventory in accordance with EMG FR-H1.

Proposed Answer: C. Trip all RCPs and initiate Bleed and Feed in accordance with EMG FR-H1

Explanation (Optional):

- A. Incorrect, this would be an action potentially required if Bleed and Feed criteria were not met
- B. Incorrect, RCS pressure is greater than SG pressure
- C. Correct, setpoint for bleed and feed is 26% on 3 of 4 SGs.
- D. Incorrect, this would be appropriate if not at bleed and feed criteria.

Technical Reference(s): EMG FR-H1 Foldout (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732346 R1 (As available)

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

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

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

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

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	E12 G2.4.6	
	Importance Rating	_____	4.0

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

Proposed Question: SRO 81

A transient occurred and conditions are:

- Safety Injection on Low Steam Line Pressure
- EMG C-21, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, is in progress
- Step 5, **Control Feed Flow To Minimize RCS Cooldown**, RNO is complete
- AFW flow is 30,000 lbm/hr to each SG.
- S/G conditions are:
  - A - 20% WR, 355 psig and increasing
  - B - 15% WR, 300 psig and decreasing
  - C - 15% WR, 290 psig and decreasing
  - D - 25% WR, 355 psig and decreasing

Which ONE (1) of the following procedures will be used to mitigate the event in progress?

- A. Continue EMG C-21, step 6.
- B. Transition to EMG FR-H5, RESPONSE TO STEAM GENERATOR LOW LEVEL.
- C. Transition to EMG FR-H1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.
- D. Transition to EMG E-2, FAULTED STEAM GENERATOR ISOLATION.

Proposed Answer: D. Transition to EMG E-2, FAULTED STEAM GENERATOR ISOLATION.

Explanation (Optional):

When pressure in any SG rises, transition back to E-2, unless in SI termination sequence. A would be correct if SI termination sequence was active. B is plausible because conditions for procedure entry are met. C is plausible because the entry conditions for the procedure are met, except that AFW has been manually throttled

Technical Reference(s): C-21 Foldout (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 20737 (As available)

Question Source: Bank # X (16495)  
Modified Bank #                      (Note changes or attach parent)  
New                     

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41                       
55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	068 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.

Proposed Question: SRO 82

Given the following conditions:

- The unit is at 100% power.
- A fire is in progress.
- Smoke has entered the control room.
- AFW system valve indications are becoming erratic.
- The BOP determines that the TDAFW pump is running.
- The Shift Manager determines that evacuation of the control room is required.

Which ONE (1) of the following actions will be directed prior to evacuating the control room?

- A. Enter OFN RP-013, CONTROL ROOM NOT HABITABLE. Trip the reactor, trip the turbine, and initiate CRVIS
- B. Enter OFN RP-017, CONTROL ROOM EVACUATION. Trip the reactor and Fast Close MSIVs.
- C. Enter OFN RP-017, CONTROL ROOM EVACUATION. Trip the reactor, trip the turbine, and initiate CRVIS.
- D. Enter OFN RP-013, CONTROL ROOM NOT HABITABLE. Trip the reactor and Fast Close MSIVs.

Proposed Answer: B. Enter OFN RP-017, CONTROL ROOM EVACUATION. Trip the reactor and Fast Close MSIVs.

Explanation (Optional):

For conditions where plant control is lost (AFW system erratic behavior) enter OFN RP-017. For conditions where plant control is NOT lost but CR evac is required, enter OFN RP-013. For either condition, turbine trip is not performed but MSIV fast closure is performed to isolate the secondary plant

Technical Reference(s): OFN RP-013, 017 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732427 R2 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41                       
55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	E06 EA2.1	_____
	Importance Rating	_____	4.2

Ability to determine and interpret the following as they apply to the (Degraded Core Cooling) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Proposed Question: SRO 83

The unit has tripped due to a Loss of Coolant Accident (LOCA).

After entering EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT, the crew transitioned to EMG FR-Z1, RESPONSE TO HIGH CONTAINMENT PRESSURE, and completed the procedure.

The crew has returned to EMG E-1 and the following conditions now exist:

- All Reactor Coolant Pumps STOPPED
- Reactor Vessel Level Indicating System UNAVAILABLE
- Core Exit Temperatures 720°F
- Containment Pressures 30 psig
- Pressurizer Level 0%

Which procedure will the crew now perform based on the above conditions?

- A. Continue with EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT.
- B. Transition to EMG FR-Z1, RESPONSE TO HIGH CONTAINMENT PRESSURE.
- C. Transition to EMG FR-I2, RESPONSE TO LOW PRESSURIZER LEVEL.
- D. Transition to EMG FR-C2, RESPONSE TO DEGRADED CORE COOLING.

Proposed Answer: D. Transition to EMG FR-C2, RESPONSE TO DEGRADED CORE COOLING.

Explanation (Optional):

Entry conditions exist for FR-C2 Orange path procedure making Ans. A incorrect and Ans. D correct. Ans. B is incorrect because FR-Z1 has been completed and should not be redone even though entry conditions exist. Conditions also exist for entry into FR-I2 but it is a yellow path so is lower on the list than FR-C2 making Ans. C incorrect.

Technical Reference(s): EMG F-0, Critical Safety (Attach if not previously provided)  
Function Status Trees, AP 15C-  
003

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1732338 R2 (As available)

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

Question History: Last NRC Exam 2001 NRC  
77

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

10 CFR Part 55 Content: 55.41                       
55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	E09 G2.4.6	_____
	Importance Rating	_____	4.0

Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.

Proposed Question: SRO 84

Given the following conditions:

- A reactor trip has occurred due to a loss of offsite power.
- The operating crew is performing actions of EMG ES-04, NATURAL CIRCULATION COOLDOWN.
- Train "A" of RVLIS is out of service.
- The crew has commenced RCS cooldown and depressurization.
  - RCS pressure is 1780 psig and trending DOWN.
  - RCS Tavg is 448 deg. F and trending DOWN.
  - RCS cooldown rate MUST be performed at 60 deg F/Hr. due to secondary inventory concerns.
  - Pressurizer level is 35% and trending UP slowly.

Which one of the following actions will be required in accordance with EMG ES-04?

- A. Repressurize the RCS to minimize void growth in accordance with EMG ES-04, NATURAL CIRCULATION COOLDOWN.
- B. Actuate safety injection and transition to EMG E-2, FAULTED STEAM GENERATOR ISOLATION.
- C. Transition to EMG ES-05, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITHOUT RVLIS).
- D. Transition to EMG ES-06, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLIS).

Proposed Answer: D. Transition to EMG ES-06, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLIS).

Explanation (Optional):

A Incorrect. Do not raise pressure with elevated cooldown rate. Would raise pressure under normal cooldown conditions if bubble was forming

B Incorrect. No SI requirements met. Subcooling is high and PRZR level is high. Potential PTS event if SI is initiated.

C Incorrect. RVLIS is available (Train 'B')

D is correct. Either ES-05 or ES-06 will be entered if cooldown must be performed at > 50 deg F per hour

Technical Reference(s): ES-04, Note prior to step 15 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1732317 R3 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41                       
55.43 5

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	E02 EA2.2	_____
	Importance Rating	_____	4.0

Ability to determine and interpret the following as they apply to the (SI Termination) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: SRO 85

Given the following conditions:

- A Reactor Trip and Safety Injection have occurred.
- The crew is performing diagnostic actions of EMG E-0.
- The following conditions exist:
  - RCS Pressure is 2150 psig and rising.
  - Pressurizer level is 36% and rising.
  - SG Narrow Range levels are 35% and stable.
  - SG Pressures are 1050 psig and slowly decreasing.
  - RCS temperature is 555 deg F and slowly decreasing.

Which ONE (1) of the following describes the appropriate procedure for mitigation of the event in progress?

- A. EMG ES-02, REACTOR TRIP RESPONSE, to stabilize secondary plant parameters and transition to normal plant shutdown procedures.
- B. EMG ES-03, SI TERMINATION, to remove SI from service and prevent overfill of the pressurizer.
- C. EMG E-2, FAULTED STEAM GENERATOR ISOLATION, to locate and isolate the faulted SG.
- D. EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT, to ensure appropriate equipment is in service and to determine appropriate recovery procedure.

Proposed Answer: B. EMG ES-03, SI TERMINATION, to remove SI from service and prevent overfill of the pressurizer.



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	008 G2.2.22	_____
	Importance Rating	_____	4.1

Equipment Control Knowledge of limiting conditions for operations and safety limits.

Proposed Question: SRO 86

The unit is at 100% power. The following problems develop on 3/3/06.

- At 1900, "A" CCW train is declared inoperable.
- At 2300, "B" CCW train is declared inoperable.

Which ONE (1) of the following is the LATEST time that the unit must be in Mode 3?

- A. 0200 on 3/4/06
- B. 0600 on 3/4/06
- C. 0200 on 3/7/06
- D. 0600 on 3/7/06

Proposed Answer: B. 0600 on 3/4/06

Explanation (Optional):

TS 3.0.3 requires 7 hours to be in Hot Standby when beyond the limit defined by LCOs.

Distractor A is 7 hours from the original failure of train A. Distractor C is the normal completion time of 72 hours plus 7 hours from the failure of train A, and distractor D is the 72 hour completion time for repairs plus 7 hours from failure of Train B

Technical Reference(s): TS 3.7.7, TS 3.0.3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732701 R1 (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New

X

Question History:

Last NRC Exam \_\_\_\_\_

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

10 CFR Part 55 Content:

55.41 \_\_\_\_\_

55.43

2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	013 A2.03	_____
	Importance Rating	_____	4.7

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

Proposed Question: SRO 87

Given the following conditions:

- The plant is in Mode 3.
- RCS Cooldown is in progress in accordance with GEN 00-006, HOT STANDBY TO COLD SHUTDOWN.
- RCS temperature is 490 deg F.
- RCS pressure is 1850 psig.

An event subsequently occurs, causing the following conditions:

- RCS pressure is 1100 psig and rapidly dropping.
- Containment pressure is 4 psig and rising.
- Plant equipment responds as designed.

Which ONE (1) of the following describes the plant condition, and action required?

- SI is NOT automatically actuated. Unblock automatic SI actuation and realign actuated equipment in accordance with EMG ES-03, SI TERMINATION.
- SI is NOT automatically actuated. Manually actuate SI and verify ESF equipment alignment in accordance with EMG E-0, Attachment F.
- SI has automatically actuated. Enter EMG E-0, REACTOR TRIP OR SAFETY INJECTION, and verify ESF equipment alignment in accordance with Attachment F.
- SI has automatically actuated. Realign actuated equipment in accordance with EMG ES-03, SI TERMINATION.

Proposed Answer: C. SI has automatically actuated. Enter EMG E-0, REACTOR TRIP OR SAFETY INJECTION, and verify ESF equipment alignment in accordance with Attachment F.

Explanation (Optional):

A LOCA has occurred. Low Steam Pressure and Low Pressurizer Pressure SI has been blocked, making A and B plausible but wrong. High Containment Pressure is not blocked, so SI will actuate based upon High 1 signal. D is incorrect because ES-03 would not be performed when an SI signal is required.

Technical Reference(s): EMG E-0 Purpose 1.2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732313 R1 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	064 G2.4.4	_____
	Importance Rating	_____	4.3

Emergency Procedures / Plan Ability to recognize abnormal indications for system operating parameters which are entry conditions for emergency and abnormal operating procedures.

Proposed Question: SRO 88

Given the following conditions:

- The plant is operating at 100% power.
- EDG B is out of service and is expected to return to service in two (2) hours.
- Subsequently, the following events occur:
  - A loss of offsite power occurs.
  - The reactor is tripped and the crew enters EMG E-0, REACTOR TRIP OR SAFETY INJECTION.
  - SI is NOT actuated.
  - The crew made a transition to EMG FR-H1, LOSS OF SECONDARY HEAT SINK, based on a CSFST RED Path.

Subsequently, EDG A output breaker trips on a bus fault.

Which ONE (1) of the following describes the actions that will be taken?

- A. Immediately transition to EMG C-0, LOSS OF ALL AC POWER
- B. Restore feed in accordance with EMG FR-H1, and then return to EMG E-0 to restore EDG A.
- C. Remain in EMG FR-H1 until directed to return to procedure in effect, and then transition to EMG C-0.
- D. Remain in EMG FR-H1 unless a higher priority RED condition is observed. When directed to return to procedure in effect, return to EMG E-0. Restore EDG A or B in EMG ES-02, REACTOR TRIP RESPONSE.

Proposed Answer: A. Immediately transition to EMG C-0, LOSS OF ALL AC POWER

Explanation (Optional):

- A. Correct.
- B. Incorrect. No AC power is available, therefore transition to C-0 is required.
- C. Incorrect. Transition to C-0 immediately, even if a RED condition exists.
- D. Incorrect. This would be correct if only one EDG was tripped.

Technical Reference(s): C-0 entry conditions (Attach if not previously provided)  
WOG EOP User's Guide

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1732329 R2 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41                       
55.43 5

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	005 G2.2.25	_____
	Importance Rating	_____	3.7

Equipment Control: Knowledge of bases in technical specifications for LCOs and safety limits.

Proposed Question: SRO 89

The plant is in MODE 6. Refueling is in progress.

Which ONE (1) of the following requirements is designed to limit the potential for unexpected criticality events?

- A. Greater than 23 feet of borated water is maintained above the reactor vessel flange to limit the effect of inadvertent dilution events.
- B. An SRO in containment is responsible for all activities related to refueling to ensure that positive reactivity is **NOT** added.
- C. At least 1 Source Range channel is required to be OPERABLE to monitor source range counts.
- D. One loop of RHR is required to be in operation to prevent boron stratification of the RCS.

Proposed Answer: D. One loop of RHR is required to be in operation to prevent boron stratification of the RCS.

Explanation (Optional):

- A. Incorrect. 23 feet is required for fuel movement and is required for decay heat removal.
- B. Incorrect. SRO directs fuel movement, but would not prevent a return to criticality (location of fuel assemblies directed by others, ie, reactor engineer).
- C. Incorrect. Source range channels are used to monitor the core reactivity conditions but would not prevent a challenge to criticality and 2 are required.
- D. Correct. A purpose of RHR during refueling is to mix the borated coolant to minimize the possibility of criticality.

Technical Reference(s): Tech Spec 3.9.5 and basis (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732701 R1 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41                       
55.43 2

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	103 A2.04	_____
	Importance Rating	_____	3.6

Ability to (a) predict the impacts of the following malfunctions or operations on the containment system-and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations Containment evacuation (including recognition of the alarm).

Proposed Question: SRO 90

Given the following conditions:

- You are the Refueling SRO.
- Containment radiation monitors are rising rapidly.
- The Containment Evacuation alarm has been sounded by the Control Room.
- Containment Evacuation is in progress.

Which ONE (1) of the following actions must you perform in accordance with OFN KE-018, FUEL HANDLING ACCIDENT?

- A. Ensure the Fuel Transfer Cart is placed in the SFP.
- B. Manually actuate Containment Purge Isolation (CPIS).
- C. Evacuate unnecessary personnel from the Fuel Building.
- D. Manually actuate a Fuel Building Isolation (FBIS).

Proposed Answer: A. Ensure the Fuel Transfer Cart is placed in the SFP.

Explanation (Optional):

- A. Correct.
- B. Incorrect. Would be performed later once Ctmt is secured.
- C. Incorrect. Accident not in Fuel Building.
- D. Incorrect. Accident not in Fuel Building.

Technical Reference(s): OFN KE-018, Step 3.c (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732428 R3 (As available)

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

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

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

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 5, 7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	2
	K/A #	015 G2.2.25	_____
	Importance Rating	_____	_____

Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits

Proposed Question: SRO 91

Given the following conditions:

- A reactor startup is in progress.
- Both Intermediate Range channels indicate approximately 5 E -11 amps.
- Source Range Channel N-31 fails DOWNSCALE.

Which ONE (1) of the following describes the required operator response and the Technical Specification basis for the response?

- Continue the reactor startup; with only one source range channel operable; 48 hours is allowed to restore two channels to service.
- Suspend the reactor startup; source range channels are not required to trip the reactor; however, the source range monitoring functions must be available.
- Continue the reactor startup; the Intermediate Range Neutron Flux Trip and the Power Range Neutron Flux-Low Trip provide the necessary core protection.
- Suspend the reactor startup; with only one source range channel operable, the minimum required Source Range High Flux Trip protection is not met.

Proposed Answer: D. Suspend the reactor startup; with only one source range channel operable, the minimum required Source Range High Flux Trip protection is not met.

Explanation (Optional):

A Incorrect. Cannot continue to Mode 1 or go above P-6.

B Incorrect. Source Range is required for Rx Trip.

C Incorrect. May not continue, and PR High Flux Low Setpoint is not enabled.

Technical Reference(s): TS 3.3.1 Basis I.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732701 R1 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41                       
55.43 2,5

Comments:  
WTSI Bank

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	2
	K/A #	016 G2.4.47	_____
	Importance Rating	_____	3.7

Emergency Procedures / Plan Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Proposed Question: SRO 92

The plant was operating at 98% power when a loss of off-site power occurred.

Twenty minutes later, the following plant conditions exist:

- RCS pressure is 2235 psig and slowly increasing.
- RCS Loop T<sub>HOT</sub> is 602°F in all 4 loops and trending down slowly.
- RCS Loop T<sub>COLD</sub> is 560°F in all 4 loops and stable.
- Core exit TCs indicate approximately 580°F and stable.
- Pressure is approximately 1130 psig in all steam generators.

Which ONE (1) of the following describes the current plant conditions and action that will be directed?

- Natural circulation does not exist. Heat removal may be established by opening the condenser steam dumps in accordance with EMG E-0, REACTOR TRIP OR SAFETY INJECTION.
- Heat removal is being maintained by condenser steam dumps. Verify that Natural circulation exists in accordance with EMG ES-02, REACTOR TRIP RESPONSE.
- Natural circulation does not exist. Heat removal may be established by opening the atmospheric relief valves in accordance with EMG E-0, REACTOR TRIP OR SAFETY INJECTION.
- Heat removal is being maintained by atmospheric relief valves. Verify that Natural circulation exists in accordance with EMG ES-02, REACTOR TRIP RESPONSE.

Proposed Answer: D. Heat removal is being maintained by atmospheric relief valves. Verify that Natural circulation exists in accordance with EMG ES-02, REACTOR TRIP RESPONSE.

Explanation (Optional):

With Temperatures stable and Tcold at Tsat for SG pressure, and Delta T less than full load, Natural Circulation exists. Because a Loss of Off-Site power has occurred, Circ Water Pumps are unavailable, making the condenser unavailable. Conditions for SI do not exist, so EMG E-0 would not be the appropriate procedure to use. The crew will be in ES-02 or transitioning to ES-04, Natural Circulation Cooldown

Technical Reference(s): ES-02 (Attach if not previously provided)  
\_\_\_\_\_

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

Learning Objective: 1732315 R3 (As available)

Question Source: Bank # X (16524)  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	2
	K/A #	035 A2.01	_____
	Importance Rating	_____	4.6

Ability to (a) predict the impacts of the following malfunctions or operations on the S/GS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Faulted or Ruptured SGs

Proposed Question: SRO 93

Given the following conditions:

- A reactor trip and safety injection has occurred.
- The crew is performing the diagnostic steps of EMG E-0, REACTOR TRIP OR SAFETY INJECTION.
- RCS pressure is 1600 psig and DECREASING.
- PZR level is offscale LOW.
- Tav<sub>g</sub> is 500°F and DECREASING.
- Containment pressure is 3 psig and INCREASING.
- SG A pressure is 620 psig and DECREASING.
- SG B, C and D pressures are 900 psig and STABLE.

Which ONE (1) of the following actions and procedures will be performed immediately following transition from EMG E-0?

- Align Normal Charging and stop ECCS Pumps in accordance with EMG ES-03, SI TERMINATION.
- Initiate a controlled RCS Cooldown and Depressurization in accordance with EMG ES-11, POST LOCA COOLDOWN AND DEPRESSURIZATION.
- Isolate the affected Steam Generator in accordance with EMG E-2, FAULTED STEAM GENERATOR ISOLATION.
- Stabilize secondary plant parameters and transition to the appropriate plant procedure in accordance with EMG ES-02, REACTOR TRIP RESPONSE.

Proposed Answer: C. Isolate the affected Steam Generator in accordance with EMG E-2, FAULTED STEAM GENERATOR ISOLATION.

Explanation (Optional):

- A. Incorrect. Criteria is not met for SI Termination.  
B. Incorrect. Transition to ES-11 occurs from E-1 or from E-2.  
C. Correct.  
D. Incorrect. SI is actuated; ES-02 would not apply.

Technical Reference(s): E-2 Entry, E-0, Step 15 RNO (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: 1732324 R2 (As available)

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

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

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

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

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		1
	K/A #	G2.1.5	
	Importance Rating		3.4

Ability to locate and use procedures and directives related to shift staffing and activities.

Proposed Question: SRO 94

Given the following conditions:

- The unit is in Mode 1.
- The STA assigned to the shift is standing a proficiency watch in the CRS position.
- There are NO other STA qualified employees on site.
- A LOCA occurs, resulting in a reactor trip and safety injection actuation.

Which ONE (1) of the following describes the action required with relation to shift staffing?

- A. An STA qualified individual must immediately be called in to support emergency operations.
- B. The Work Control Center SRO will assume the Control Room command function. The CRS will assume the STA function.
- C. The CRS will assume both Control Room command function and perform the duties of the STA.
- D. The Shift Manager will assume the Control Room command function. The CRS will assume the STA function.

Proposed Answer: B. The Work Control Center SRO will assume the Control Room command function. The CRS will assume the STA function.

Explanation (Optional):

The SRO normally assigned as CRS will assume the Work Control Center SRO function unless a situation arises that an STA is required for mitigation. A is incorrect because it is action for unavoidable absence (Emergency – up to 2 hours) C is incorrect because minimum manning would not be met. D is incorrect because the SM will not assume the command function.

Technical Reference(s): AP 21-001, AP 21-003 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1733211 R4 (As available)

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

Question History: Last NRC Exam                     

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

10 CFR Part 55 Content: 55.41                       
55.43 1,5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	G2.2.17	
	Importance Rating		3.5

Knowledge of the process for managing maintenance activities during power operations.

Proposed Question: SRO 95

Maintenance activities being performed during power operations result in work being added that changes the original work scope.

Which ONE (1) of the following procedures is used to evaluate the change in scope?

- A. AP 22C-002, WORK CONTROLS
- B. AP 22C-003, OPERATIONAL RISK ASSESSMENT
- C. AP 22A-001, SCREENING, PRIORITIZATION, AND PRE-APPROVAL
- D. AP 16C-006, MPAC WORK REQUEST / WORK ORDER PROCESS CONTROLS

Proposed Answer: B. AP 22C-003, OPERATIONAL RISK ASSESSMENT

Explanation (Optional):

Need Procedures to describe what each is for

Technical Reference(s): AP-22C-003 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1733205 R15 (As available)

Question Source: Bank # X 16910  
Modified Bank # (Note changes or attach parent)  
New

Question History: Last NRC Exam

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

10 CFR Part 55 Content: 55.41             
55.43   5  

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		2
	K/A #	G2.2.7	
	Importance Rating		3.2

Knowledge of the process for conducting tests or experiments not described in the safety analysis report.

Proposed Question: SRO 96

Engineering requests that testing be performed on ESF instrumentation that is not currently covered by a plant procedure, process, or other documentation.

The test has never been performed at Wolf Creek.

Which ONE (1) of the following is required prior to performing the test?

- A. The Shift Manager must invoke 10CFR50.54(x) and (y) prior to the test being performed.
- B. An Applicability Determination must be performed in accordance with AP 05-005, DESIGN, IMPLEMENTATION, AND CONFIGURATION CONTROL OF MODIFICATIONS.
- C. The test must be contained within a clearance boundary and must not affect operable equipment
- D. A 10CFR50.59 screening/evaluation must be performed prior to performance of the test

Proposed Answer: D. A 10CFR50.59 screening/evaluation must be performed prior to performance of the test

Explanation (Optional):

A is incorrect because an emergency condition does not exist. B is incorrect because it has already been determined that the test does not have procedure or process associated with it. C is incorrect because the test can possible be performed on operable equipment or outside of a clearance boundary once a 10CFR50.59 evaluation is performed.

Technical Reference(s): AP 05-005, AP 26A-003 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1733206 R2 (As available)

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

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

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

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 1,3,5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	3
	K/A #	G2.3.6	_____
	Importance Rating	_____	3.1

Knowledge of the requirements for reviewing and approving release permits.

Proposed Question: SRO 97

Who is responsible for approving a radioactive release if any of the conditions on the checklist for the release are either NOT met or marked False?

- A. On Shift Chemistry Technician AND Shift Manager
- B. Chemistry Supervisor AND Control Room Supervisor
- C. Control Room Supervisor AND On-Shift Chemistry Technician
- D. Shift Manager AND Chemistry Supervisor

Proposed Answer: D. Shift Manager AND Chemistry Supervisor

Explanation (Optional):

Answer A is incorrect as Chem Tech prepares the release and is not part of approval. Answer B is incorrect as CRS is responsible for performing the release and ensuring all data is correctly entered. Answer C is incorrect as both individuals are not part of the approval chain for releases. Answer D is correct, as they both approve a release if all conditions on the checklist are not met

Technical Reference(s): AP 07B-001, "Radioactive Releases", Section 5.6 (Attach if not previously provided)

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\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: LO1733204, Objective 10 (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # X (Note changes or attach parent)

New \_\_\_\_\_

Question History: Last NRC Exam 2004 #91Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 4

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	3
	K/A #	G2.3.4	_____
	Importance Rating	_____	3.1

Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.

Proposed Question: SRO 98

For a Wolf Creek employee, what radiation exposure limit requires authorization from the Manager Chemistry/Radiation Protection and approval by the Plant Manager to exceed that limit?

- A. 1000 mrem/yr site
- B. 2000 mrem/yr site
- C. 3000 mrem/yr total
- D. 4000 mrem/yr total

Proposed Answer: D. 4000 mrem/yr total

Explanation (Optional):

Ans. A and B are incorrect as 1000 mrem/yr and 2000 mrem/yr can be exceeded if annual dose is documented. (2000 requires extra approval) Ans. D requires full approval to exceed. Ans. C is incorrect according to site imposed limits, approvals required by Group Supervisor and Chem/RP Mgr.

Technical Reference(s): AP 25A-001, Att B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NONE

Learning Objective: L01733204, obj 1 (As available)

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

Question History: Last NRC Exam 2001 NRC

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

10 CFR Part 55 Content: 55.41             
55.43   4  

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	4
	K/A #	G2.4.33	_____
	Importance Rating	_____	2.8

Knowledge of the process used to track inoperable alarms.

Proposed Question: SRO 99

Which ONE (1) of the following procedures provides the guidance for documenting and tracking annunciators that have been disabled as a result of nuisance alarms?

- A. AP 21E-001, Clearance Orders
- B. AP 21I-001, Temporary Modifications
- C. AP 21F-001, Equipment Out of Service Control
- D. AP 21H-001, Instrument Out of Service Control

Proposed Answer: C. AP 21F-001, Equipment Out of Service Control

Explanation (Optional):

In Modes 5, 6, or defueled, as well as Modes 1-4 with Ops Mgr concurrence and a work request, tracking is accomplished by use of 21F-001. A clearance may disable an annunciator, but the clearance number would be documented on The equipment out of service log. Instruments taken out of service that disable annunciators would also have documentation in 21F-001. Pulling an annunciator card in Modes 1-4 may be governed by 21I-001, but tracked using 21F-001

Technical Reference(s): AP-21F-001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1733213 R4 (As available)

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

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

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43   3  

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	4
	K/A #	G2.4.9	_____
	Importance Rating	_____	3.9

Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.

Proposed Question: SRO 100

Given the following conditions:

- A plant heatup is in progress.
- RCS temperature is 325 degrees F.
- RCS pressure is 825 psig.
- PZR level is 10% and lowering.
- Containment radiation monitor indications are rising.

Which ONE (1) of the following procedures will be directed to mitigate the event in progress?

- A. OFN BB-031, SHUTDOWN LOCA
- B. OFN BB-007, RCS LEAKAGE HIGH
- C. OFN EJ-015, LOSS OF RHR COOLING
- D. EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

Proposed Answer: A. OFN BB-031, SHUTDOWN LOCA

Explanation (Optional):

With the plant in Mode 3 or 4 and the accumulators isolated, OFN BB-031 is the correct procedure to use. EJ-015 would be correct in Modes 5 or 6. BB-007 would be correct in Modes 1, 2, or 3 with accumulators unisolated. E-1 would be correct for LOCA post trip.

Technical Reference(s): OFN BB-031 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 1732425 R2 (As available)

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

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

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

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

Comments: