

**Perry**

**January 2001**

**PROPOSED WRITTEN  
EXAMINATION**

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION JANUARY 2001  
SENIOR REACTOR OPERATOR**

**QUESTION 1**

In MODES 1, 2, and 3, compliance with LCO 3.6.2.1, Suppression Pool Average Temperature, and LCO 3.6.2.3, RHR Suppression Pool Cooling System, is required to \_\_\_\_\_.

- A. ensure the Drywell peak temperature and pressure remain below design limits following a DBA-LOCA.
- B. ensure the Primary Containment peak temperature and pressure remain below design limits following a DBA-LOCA.
- C. maintain a sufficient amount of cooled water to condense the steam from the SRV quenchers or RCIC turbine exhaust line during all modes of plant operation.
- D. maintain an adequate suppression pool heat sink volume to ensure Primary Containment pressure and temperature remain within design limits.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295013 AK2.01	
	Importance Rating		3.7
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Bases for LCO 3.6.5.5, Drywell Air Temperature C – Function of the Suppression Pool but not the Bases for LCO 3.6.2.1 and 3.6.2.3. D – Bases for LCO 3.6.2.4, SPMU System.			
Technical Reference(s): TS 3.6.2.1 LCO & Bases, LCO 3.6.2.3 LCO & Bases		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-001-10. Obj B			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question):			

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**QUESTION 2**

In response to which one of the following events will fuel temperature act first to change the reactivity addition to the core?

- A. A control rod drop during reactor power operation.
- B. The tripping of the Main Turbine at 45% reactor power.
- C. A safety relief valve opening during reactor power operation.
- D. The loss of a feedwater heater (extraction steam isolated) during reactor power operation.

ANSWER: A
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<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295014 AK2.03	
	Importance Rating		3.4
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B/C/D – Each affects reactivity (and therefore power) through void and/or moderator temperature changes first. Therefore, fuel temperature (i.e., doppler) is not the first reactivity coefficient whose effect is seen.</p>			
Technical Reference(s): GP Reactor Theory , USAR Section 15.4		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3301-003-08 Obj 20 , OT-3401-005-11 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): Requires student to analyze each event to determine whether positive or negative reactivity is added and whether fuel temperature (doppler) will be the first reactivity coefficient to respond.			

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**QUESTION 3**

A CAUTION in the Plant Emergency Instructions states, "Operation of LPCS or RHR with suction from the Suppression Pool and Suppression Pool level less than 5.75 feet may result in equipment damage."

Select the statement below that describes the application of this limit.

- A. The equipment damage is expected to be immediate. Operation of the pumps at a Suppression Pool less than 5.75 feet is NEVER permitted unless a 50.54(x) determination is made.
- B. The equipment damage is expected to be immediate. Never the less, operation of the pumps at a Suppression Pool level less than 5.75 feet is permitted under certain circumstances even without a 50.54(x) determination.
- C. The equipment damage is NOT expected to be immediate. The importance of the pumps to plant safety requires that operation of the pumps at a Suppression Pool level less than 5.75 feet is NEVER permitted unless a 50.54(x) determination is made.
- D. The equipment damage is NOT expected to be immediate. Thus, even though the pumps are important to plant safety, operation of the pumps at a Suppression Pool level less than 5.75 feet is permitted under certain circumstances even without a 50.54(x) determination.

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #		1		
	Group #		1		
	K/A#	295030 EK2.04			
	Importance Rating		3.8		
Proposed Question: See attached					
Proposed Answer: See attached					
<p>Explanation (Why the distractors are incorrect):</p> <p>A - The damage is not expected to be immediate and this limit may be disregarded if core cooling is threatened.</p> <p>B - The damage is not expected to be immediate.</p> <p>C - This limit may be disregarded if core cooling is threatened.</p>					
Technical Reference(s): PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-005-01 Obj D					
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)		
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>          </u>			
10 CFR Part 55 Content:	55.41 55.43	<u>  X  </u> <u>  X  </u>			
Comments (Why is it an upper level question):					

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**QUESTION 4**

The plant is operating at 5% power and a test of RCIC has just been completed. In accordance with the power ascension schedule, a test of the Safety Relief Valves (SRVs) is now in progress. Testing is in progress when the Control Room Operators notice that Suppression Pool average water temperature has inadvertently increased to 106 °F.

What is the MINIMUM action required?

- A. Enter PEI-T23, Containment Control and suspend testing of SRVs.
- B. Enter LCO 3.6.2.1, Suppression Pool Average Temperature and suspend testing of SRVs.
- C. Enter PEI-T23, Containment Control and LCO 3.6.2.1, Suppression Pool Average Temperature.
- D. Enter PEI-T23, Containment Control and LCO 3.6.2.1, Suppression Pool Average Temperature and suspend testing of SRVs.

**ANSWER: B**



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295013 AA2.01	
	Importance Rating		4.0
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A/C/D – The LCO must be entered. However, there is no requirement to enter PEI-T23 since the cause of the temperature increase was due to pre-planned testing.			
Technical Reference(s): LCO 3.6.2.1, PAP-0528		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-001-10 Obj A & C, OT-3039-001-04 Obj A & D			
Question Source:	Bank # _____	(Note changes or attach parent)	
	Modified Bank # _____		
	New <u>  X  </u>		
Question History:	Previous NRC Exam _____		
	Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u>		
	Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 _____		
	55.43 <u>  X  </u>		
Comments (Why is it an upper level question): N/A			

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**QUESTION 5**

The Unit Supervisor ordered the Control Room to be abandoned due to toxic fumes. The plant is being operated from the Remote Shutdown Panel (C61-P001). Plant cool down is in progress with preparations being made to place RHR Loop 'A' in the Shutdown Cooling mode of operation. The Unit Supervisor directs the operator to verify that reactor pressure is less than 135 psig prior to placing shutdown cooling into operation.

What is the reason for this direction to ensure reactor pressure is less than 135 psig?

- A. If reactor pressure exceeds 135 psig with shutdown cooling in operation, then shutdown cooling will isolate.
- B. If reactor pressure exceeds 135 psig with shutdown cooling in operation, then RHR pump seals could be damaged.
- C. The relief valve on the RHR pump suction line is designed to lift at 135 psig.
- D. The relief valve on the Shutdown Cooling suction line is designed to lift at 135 psig.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295016 AA1.08	
	Importance Rating		4.0
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Interlocks/automatic functions are bypassed due to operation from the RSP. C and D - The setpoint for this relief is 200 psig.			
Technical Reference(s): IOI-11, SDM-E12 (Table E12-5)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-C61 Obj E, OT-3036-004-E12 Obj C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Student must analyze plant conditions to determine that an isolation will not occur.			

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**QUESTION 6**

A plant transient has resulted in a reactor scram.

Plant conditions are as follows:

- No systems can be aligned for injection.
- MSIVs are closed.
- Containment pressure is 2.1 psig.
- Drywell pressure is 7.5 psig.
- All control rods are fully inserted.

Given these plant conditions, which one of the following conditions assure adequate core cooling?

- A. Reactor water level is unknown, no SRVs are open, and reactor pressure is 265 psig.
- B. Reactor water level is unknown, 8 SRVs are open, and reactor pressure is 45 psig.
- C. Reactor water level is -40 inches, no SRVs are open, and reactor pressure is 800 psig
- D. Reactor water level is -40 inches, 5 SRVs are open, and reactor pressure is 25 psig.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295031 EA2.04	
	Importance Rating		4.8
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A &amp; B – When water level is unknown, in order to assure adequate core cooling, at least 5 SRVs must be open and reactor pressure must be at least 60 psig above Containment pressure. (RPV Flooding)</p> <p>D – The opening of SRVs prior to reaching MZIWL reduces the effectiveness of steam cooling.</p>			
Technical Reference(s): PEI Bases Document, PEI-B13, RPV Control(Non-ATWS), PEI-B13, RPV Flooding		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3042-005-02 Obj F, OT-3402-07-13 Obj C			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41 55.43	<u>          </u> <u>  X  </u>	
Comments (Why is it an upper level question): Requires student to analyze plant conditions to determine when there is adequate core cooling.			

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QUESTION 7

A plant event is in progress. PEI-N11, Containment Leakage Control, has been entered.

In the Auxiliary Building, 574', area radiation monitors indicate as follows:

- D21-K112, AB EL 574' East                      4.2 Rem/hr
- D21-K122, AB EL 574' West                      4.1 Rem/hr

The Maximum Safe Operating Condition Value for this area is 4.0 Rem/hr. The Unit Supervisor directs that the reactor be shutdown even though **NO** primary system is discharging into the area.

What is the bases for the Unit Supervisor's decision to shutdown the reactor?

- A.            Systems required to assure adequate core cooling are required to be isolated.
- B.            Two or more areas have exceeded their Maximum Safe Operating Conditions Value for Area Radiation; therefore, a direct threat to continued safe operation exists.
- C.            One area has exceeded its Maximum Safe Operating Conditions Value for Area Radiation; therefore, a direct threat to personnel safety exists.
- D.            Area radiation levels of this magnitude prohibit personnel access to the Auxiliary Building that may be required to support operation of systems required to maintain the reactor shutdown.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295033 EK3.02	
	Importance Rating		3.6
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Systems required to assure adequate core cooling are not required to be isolated.</p> <p>C / D –The reactor is directed to be shutdown only when two areas exceed their MSOCV. Also, a direct threat to personnel safety is not mentioned in the bases as a reason to shutdown the reactor.</p>			
Technical Reference(s): PEI-N11, PEI-N11 Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-001-17 Obj C & D			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X  </u> (A)	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): Requires student to analyze the conditions with respect to PEI-N11 in order to determine that two areas have exceeded their MSOCV in order to justify the decision to shutdown the reactor.			

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**QUESTION 8**

A plant startup is in progress with reactor power at 5%. The Unit Supervisor has been directed to raise reactor power to 20%. The on-shift Chemistry Technician reports the following results for the SLC Storage Tank sample:

- Net Tank Volume 4475 gallons
- Solution Concentration-WT % Boron 2.8%

Select the correct response for the indicated conditions.

**Technical Specification Section 3.1 is provided for reference.**

- A. The SLC System is OPERABLE. Reactor startup to 20% power can continue.
- B. Restore at least one SLC subsystem to OPERABLE within 8 hours or be in Hot Shutdown within the next 12 hours. Reactor startup to 20% power can continue.
- C. Restore at least one SLC subsystem to OPERABLE within 7 days or be in Hot Shutdown within the next 12 hours. Reactor startup to 20% power cannot continue.
- D. Restore at least one SLC subsystem to OPERABLE within 8 hours or be in Hot Shutdown within the next 12 hours. Reactor startup to 20% power cannot continue.

ANSWER: D



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	GEN 2.1.12 / 211000	
	Importance Rating		4.0
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Net Tank Volume is below minimum; therefore, SLC System is inoperable.</p> <p>B – Reactor startup cannot continue to 20% per LCO 3.0.4.</p> <p>C – Not in Condition A, will be in Condition B because both SLC subsystems are inoperable due to the common SLC Storage Tank.</p>			
Technical Reference(s): LCO 3.1.7		Reference Attached: <input checked="" type="checkbox"/> X (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: LCO 3.1.7 and Bases, Tech Spec Section 3.0 (LCO/SR Applicability)			
Learning Objective (As available): OT-3036-005-C41 Obj G, OT-3037-006-05 Obj D			
Question Source:	Bank #	<u>B-906</u>	
	Modified Bank #	<u>          </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>	
	Comprehension or Analysis	<u>X (A)</u>	
10 CFR Part 55 Content:	55.41	<u>          </u>	
	55.43	<u>X</u>	
Comments (Why is it an upper level question): Requires student to apply LCO 3.1.7 for the SLC System based on given conditions, including application of LCO 3.0.4.			

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QUESTION 9

The Division 2 Diesel Generator (DG) received an automatic start signal due to a bus undervoltage condition.

Ten (10) seconds later the undervoltage condition still exists, starting air pressure has decreased to 150 psig, and DG speed is 100 rpm.

Which one of the following describes the current status of the Division 2 DG?

The Division 2 DG starting air valves are \_\_\_\_\_.

- A. open and the Division 2 DG will continue to roll for another 20 seconds unless its speed reaches 441 rpm.
- B. open and the Division 2 DG will continue to roll for another 5 seconds unless its speed reaches 200 rpm.
- C. closed because starting air pressure has decreased to 150 psig.
- D. closed and the Division 2 DG has successfully started.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	264000 A3.01	
	Importance Rating	3.0	3.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – The starting air valves remain open on an UV start for 15 seconds or until DG speed reaches 200 rpm.</p> <p>C – The starting air valves do not close on an UV start if starting air pressure reached 150 psig.</p> <p>D – A successful start is defined as DG speed has reached 200 rpm; at 100 rpm the DG is still considered to rolling.</p>			
Technical Reference(s): SDM-R43		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-R43/48 Obj C & D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze the given DG conditions, and in conjunction with knowledge of the DG start logic, determine the correct condition of the DG starting air valves.			

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REACTOR OPERATOR**

**QUESTION 10**

The plant is operating at power. The Motor Feed Pump is tagged out due to a motor ground. Reactor Feed Pump 'B' has just been removed from service for corrective maintenance.

What is the current operating guideline for reactor power based on the present status of the Feedwater System?

- A. 63%
- B. 66%
- C. 68%
- D. 71%

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	3
	Group #	Cat 1	Cat1
	K/A#	GEN 2.1.32	
	Importance Rating	3.4	3.8
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B – This value is 5% below the recommended power limit before power uprate. C – This is the 'max' power limit after power uprate D – This is the 'max' power limit before power uprate			
Technical Reference(s): SOI-C34, SOI-N27, ONI-N27		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-C34 Obj F OT-3036-004-N27 Obj G and I			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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**QUESTION 11**

The plant is in MODE 4 preparing for a refueling outage.

What is/are the MINIMUM action(s) that must be performed to enter into MODE 5?

- A. De-tension one reactor vessel head closure bolt.
- B. Place the Reactor Mode Switch in the REFUEL position.
- C. Place the Reactor Mode Switch in the REFUEL position and de-tension one reactor vessel head closure bolt.
- D. Place the Reactor Mode Switch in the REFUEL position and de-tension all the reactor vessel head closure bolts.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 1
	K/A#	GEN 2.1.22	
	Importance Rating		3.3
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B – This will not satisfy the entire requirement to be in MODE 5. C / D– This will place the plant in MODE 5 but it is not the minimum required action.			
Technical Reference(s): Tech Spec Table 1.1-1		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-005-02 Obj A			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 _____ 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): N/A			

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SENIOR REACTOR OPERATOR

QUESTION 12

The plant is operating during an emergency. The Operations crew determines that conditions are such that there is no appropriate action to be taken which would be in compliance with the Perry Operating License.

Whose permission, at a minimum, is required to take reasonable action(s) to maintain the plant in a safe condition **AND** when must the NRC be notified of such reasonable action(s)?

- A. Operations Shift Supervisor; notify the NRC within one (1) hour.
- B. NRC Resident Inspector; notify the NRC within one (1) hour.
- C. Operations Manager; notify the NRC within thirty (30) days in a written report.
- D. Licensed Supervising Operator; notify the NRC within thirty (30) days in a written report.

ANSWER: A



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 1
	K/A#	GEN 2.1.2	
	Importance Rating		4.0
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B – The action requires the concurrence of an SRO only, not the NRC</p> <p>C / D – This action requires the concurrence of an SRO only and must be reported to the NRC within one hour in accordance with CFR50.72</p>			
Technical Reference(s): PAP-0201, 10CFR50.54x & y, PAP-1604		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-008-02 Obj A & C, OT-3035-003-01 Obj G, OT-3039-007-01 Obj B & C			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>          </u>	
10 CFR Part 55 Content:	55.41 55.43	<u>          </u> <u>  X  </u>	
Comments (Why is it an upper level question): N/A			

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SENIOR REACTOR OPERATOR**

**QUESTION 13**

The plant is operating at 100% reactor power when annunciators MAIN TURB & FDW TRIP RCIC/L8 and RPS RX LEVEL HI L8 on panel H13-P680 alarm. All Reactor Narrow Range Level meters indicate that reactor water level is 225 inches.

The Main Turbine did NOT trip and the reactor did NOT automatically scram.

As the Unit Supervisor, which one of the following directions should be given to the Operator-at-the-Controls?

- A. Take manual control of feedwater flow and slowly return reactor water level to its normal band, and then commence a normal plant shutdown.
- B. Manually trip the Main Turbine and carryout the Immediate Actions of ONI-N32, Turbine and/or Generator Trip.
- C. Manually scram the reactor and carryout the Immediate Actions of ONI-C71-1, Reactor Scram.
- D. Enter PEI-B13, RPV Control (Non-ATWS) and manually scram the reactor.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 1
	K/A#	GEN 2.1.7	
	Importance Rating		4.4
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / B / C – PEI-B13, RPV Control (Non –ATWS) is required to be entered when a reactor scram is required and power is greater than 4%. This PEI is the higher tier document in relation to either ONI-N32 or ONI-C71-1. Also it is definitely not appropriate to take manual control of fdw to restore level and then perform a normal shutdown. The failure of the automatic actions to occur (i.e., reactor scram) dictates entry specifically into PEI-B13.</p>			
Technical Reference(s): PEI-B13, RPV Control (Non-ATWS)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-005-02 Obj A, B and F			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X  </u> (A)	
10 CFR Part 55 Content:	55.41 55.43	<u>      </u> <u>  X  </u>	
Comments (Why is it an upper level question): Requires student to analyze plant conditions, recognize the failure of automatic actions to occur, and then make a decision to shutdown the reactor.			

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**QUESTION 14**

Per PAP-1105, Surveillance Test Control, the Unit Supervisor, depending on plant conditions and amount of time available, can permit Contingent SVIs to be performed without the use of a Data Package Cover Sheet (DPCS).

Which one of the following is **NOT** a guideline that the must be adhered to if a Contingent SVI is to be performed without a DPCS?

- A. A DPCS is properly completed following performance of the SVI.
- B. An updated or current working copy of the SVI is used to perform the SVI.
- C. A Plant Narrative Log entry is made annotating the SVI number, the sections of the SVI actually performed, results, and the name(s) of the test performer(s) upon completion of the SVI.
- D. The Shift Supervisor signs the Plant Narrative Log entry, acknowledging the completion of the SVI and approval of and concurrence with the results.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 2
	K/A#	GEN 2.2.12	
	Importance Rating		3.4
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A / B / C - These are all guidelines that are required to be followed.			
Technical Reference(s): PAP-1105		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-008-03 Obj A			
Question Source:	Bank #	<u>  394  </u>	
	Modified Bank #	<u>          </u>	(Note changes or attach parent)
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>  90-001  </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>          </u>	
	55.43	<u>  X  </u>	
Comments (Why is it an upper level question): N/A			

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QUESTION 15

A refueling outage is in progress. Currently, the reactor pressure vessel has been defueled in preparation for in-vessel work.

Select the condition that would require continuous communication between the Control Room and the Refuel Floor.

- A. Replacement of a fuel support piece from the Vessel Platform.
- B. Replacement of an entire LPRM assembly from the Auxiliary Platform.
- C. Replacement of a Feedwater Sparger nozzle while standing on the top guide.
- D. Replacement of the RPV vessel head O-rings from the Vessel Platform.

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 2
	K/A#	GEN 2.2.26	
	Importance Rating		3.7
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / B / D – In-vessel work is any work that requires some part of an individual to be within the circumference of the Vessel Flange <u>and</u> below the top of the Vessel Flange. Continuous communications is established between the Control Room and the Refuel Floor during in-vessel work to ensure worker safety. None of these answers meet this definition.</p>			
Technical Reference(s): IOI-9		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): None			
Question Source:		Bank # <u>      </u> Modified Bank # <u>      </u> New <u>  X  </u>	(Note changes or attach parent)
Question History:		Previous NRC Exam <u>      </u> Previous Quiz / Test <u>      </u>	
Question Cognitive Level:		Memory or Fundamental Knowledge <u>      </u> Comprehension or Analysis <u>  X  </u> (A)	
10 CFR Part 55 Content:		55.41 <u>      </u> 55.43 <u>  X  </u>	
Comments (Why is it an upper level question): Requires student to recall analyze each condition (answer) for location of work to be performed and then apply the definition of in-vessel work in order to determine which condition would require constant communication capability.			

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QUESTION 16

During Day 26 of a refueling outage, the plant remains in a shutdown condition with reactor temperature and pressure being maintained at 150 °F and 0 psig respectively.

The RPV has been re-assembled. Refueling personnel are moving spent fuel bundles from the Containment to the FHB Spent Fuel Storage Pool with the Inclined Fuel Transfer System (IFTS).

What are the requirements for Primary Containment and Fuel Handling Building integrity during spent fuel movement?

- A. Primary Containment integrity and Fuel Handling Building integrity are required.
- B. Primary Containment integrity is required and Fuel Handling Building integrity is NOT required.
- C. Primary Containment integrity is NOT required and Fuel Handling Building integrity is required.
- D. Primary Containment integrity and Fuel Handling Building integrity are NOT required.

ANSWER: D



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 2
	K/A#	GEN 2.2.22	
	Importance Rating		4.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / B / C – Applicability of both LCOs is during movement of recently irradiated fuel. The spent fuel being moved has not occupied part of a critical reactor within the last 7 days. Therefore, each of these answers is incorrect.</p>			
Technical Reference(s): LCO 3.6.10, LCO 3.7.8		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-001-10 Obj A, OT-3037-001-11 Obj B			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 _____ 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): Requires student to analyze plant conditions in order to determine Tech Spec integrity requirements during movement of spent fuel.			

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**QUESTION 17**

In accordance with PAP-0905, Work Order Process, who may initiate the Troubleshooting Log in order to avert an imminent plant shutdown?

- A. Responsible System Engineer
- B. Shift Supervisor
- C. Unit Supervisor
- D. Operations Manager

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 2
	K/A#	GEN 2.2.20	
	Importance Rating		3.3
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A / C / D – Only the Shift Supervisor can authorize immediate troubleshooting using the Troubleshooting Log.			
Technical Reference(s): PAP-0905		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-001-04 Obj A & C			
Question Source:	Bank #		
	Modified Bank #	<u>  370  </u>	(Note changes or attach parent)
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>          </u>	
	55.43	<u>  X  </u>	
Comments (Why is it an upper level question): N/A			

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QUESTION 18

The Unit Supervisor has authorized tags to be cleared for a Clearance on the Main Steam System (B21). Numerous tags on manual valves are located in the Aux. Steam Tunnel in a Level 1 Locked High Radiation Area.

Which one of the following describes the tag removal independent verification requirements for the Main Steam System Clearance?

Independent Verification may \_\_\_\_\_.

- A. be waived by the Clearance Authority based on ALARA concerns.
- B. be waived by the Clearance Authority based on personnel safety concerns.
- C. be waived by the Operations Foreman based on ALARA concerns.
- D. not be waived by the Clearance Authority based on ALARA concerns.

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 2
	K/A#	GEN 2.2.13	
	Importance Rating		3.8
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / B / C– Standing Inst overrides the admin guidelines contained in PAP-0205 and PAP-1401; therefore, the IV may not be waived for ALARA concerns. Also, only the Clearance Authority could previously waive this IV requirement, not the OPS Foreman.</p>			
Technical Reference(s): Standing Instruction, PAP-0205, PAP-1401		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-008-02 Obj A			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): N/A			

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**QUESTION 19**

As the Shift Supervisor, you may authorize radiological activities to occur without an approved Radiation Work Permit (RWP) during an urgent situation provided that \_\_\_\_\_.

- A. the entry is into a High Radiation Area, Level 1 Locked High Radiation Area, or a Level 2 Locked High Radiation Area.
- B. the entry is into a Very High Radiation Area (VHRA).
- C. authorization is also granted by the Plant Manager.
- D. authorization is for access to High Radiation Areas only by the Non-Licensed Operators.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 3
	K/A#	GEN 2.3.7	
	Importance Rating		3.3
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B – Entry into VHRA is not allowed without a SRWP. C – Rad Protection Supervisor permission is required, not Plant manager D – condition does not fit the guidelines for an urgent situation RWP.			
Technical Reference(s): HPI-C0005		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-007-01 Obj B & C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): N/A			

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**QUESTION 20**

Access to the IFTS Valve Room in the Containment is required for surveillance purposes.

The IFTS Valve Room is controlled by a locking device providing for \_\_\_\_\_.

- A. one uniquely keyed lock whose key is maintained by the Radiation Protection Section.
- B. one uniquely keyed lock whose key is maintained by the Control Room Shift Supervisor.
- C. two uniquely keyed locks, of which one key is maintained by the Radiation Protection Section and the other key is maintained by the Control Room Shift Supervisor.
- D. two uniquely keyed locks, of which one key is maintained by the Radiation Protection Section and the other key is maintained by the Control Room Unit Supervisor.

**ANSWER: C**



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 3
	K/A#	GEN 2.3.1	
	Importance Rating		3.0
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A / B – IFTS Valve Room uses two uniquely keyed locks. D – One key is maintained by RPS and the other key is maintained by the Control Room SS, not the US.			
Technical Reference(s): PAP-0123		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-001-04 Obj A			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): N/A			

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**QUESTION 21**

The plant has entered a Site Area Emergency. No emergency facilities are operational. Two PPOs are in the plant performing PEI-SPI actions as directed by the Control Room.

To provide accountability of the two PPOs in the plant, the Shift Supervisor must \_\_\_\_\_.

- A. direct the PPOs in the plant to promptly return to the Unit 2 Control Room and use the designated Accountability Card Reader.
- B. provide the names and badge numbers of the PPOs in the plant to the OSC Coordinator, when the OSC becomes operational.
- C. provide the names and badge numbers of the PPOs in the plant to the Security Shift Supervisor.
- D. complete the Personnel Accountability Checklist for the PPOs in the plant and forward to the Central Alarm Station (CAS).

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 4
	K/A#	GEN 2.4.38	
	Importance Rating		4.0
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Applies to all Control Room staff and PPOs actually located in the Unit 2 Control Room when accountability is initiated.</p> <p>B – Applies once the OSC is operational and the PPOs have been relocated there.</p> <p>C – Not a method specified in EPI-B5.</p>			
Technical Reference(s): EPI-B5		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): EPL-0804-008-01 Obj D			
Question Source:	Bank #	B-1173	
	Modified Bank #	<u>          </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>          </u>	
	55.43	<u>  X  </u>	
Comments (Why is it an upper level question): N/A			

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**QUESTION 22**

The plant is operating at 100% reactor power when alarm ANN PWR SUPPLY FAIL is received on panel H13-P680. A Supervising Operator reports Bus D-1-A indicates 0 volts on meter R42-R011, DC VOLTS BUS D-1-A.

Additional indications on panel H13-P680 include:

- RECIRC A PUMP DIFF PR, 1B33-R605A indicates downscale
- RECIRC B PUMP DIFF PR, 1B33-R605B indicates downscale
- RFPT 'B' speed has increased to the high-speed stop
- RFPT 'A' speed has decreased after initially increasing

Which one of the following sets of Immediate Operator Actions should the Unit Supervisor verify are performed by the Supervising Operators?

- A. Select NARROW RANGE LEVEL CH 'A' and transfer control of RFPT 'A' to the Manual Speed Control Dial.
- B. Select NARROW RANGE LEVEL CH 'A' and transfer control of RFPT 'B' to the Manual Speed Control Dial.
- C. Select NARROW RANGE LEVEL CH 'B' and transfer control of RFPT 'A' to the Manual Speed Control Dial.
- D. Select NARROW RANGE LEVEL CH 'B' and transfer control of RFPT 'B' to the Manual Speed Control Dial.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 4
	K/A#	GEN 2.4.49	
	Importance Rating		4.0
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – RFPT B is the affected RFPT that must be transferred to the Manual Speed Control Dial.</p> <p>C / D – Narrow Range Level Channel A is the correct NR level channel which must be selected for a loss of Bus D-1-A.</p>			
Technical Reference(s): ONI-R42-4		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-R42 Obj E, OT-3035-001-05 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): Requires student to analyze plant conditions to determine the correct off-normal instruction to enter and the appropriate actions to be performed.			

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**QUESTION 23**

A Loss of Coolant Accident (LOCA) occurred and Containment pressure has increased above the Primary Containment Limit (PCL). PEI-T23, Containment Control, directs the Control Room Operators to vent Containment.

Which one of the following is the bases for the requirement to vent Containment?

If Containment pressure exceeds PCL, the \_\_\_\_\_.

- A. Containment pressure can no longer be determined since all Containment pressure indicators are off-scale high.
- B. design pressure limit for the Containment Equipment Hatch has been exceeded.
- C. Containment Vent Valves cannot be opened and closed.
- D. RPV Vent Valves cannot be opened.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	3
	Group #	Cat 4	Cat 4
	K/A#	GEN 2.4.18	
	Importance Rating	2.7	3.6
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Cont pressure indicators will not be off-scale (indicators go to 60 psig on P883).</p> <p>C – Cont Vent Valves can still be operated.</p> <p>D – RPV Vent Valves can still be operated.</p>			
Technical Reference(s): PEI-T23, PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-004-09 Obj C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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**QUESTION 24**

The plant is conducting a refueling outage when the following alarms are received in the Control Room:

- CNTMT VENT EXH RAD HI
- CNTMT VENT EXH RAD A/D HI HI / INOP
- CNTMT VENT EXH RAD B/C HI HI / INOP

In addition to directing the evacuation of the Containment, which one of the following identifies an additional required Immediate Action to be performed in accordance with ONI-D17, High Radiation Levels Within the Plant?

- A. Notify Health Physics and Chemistry.
- B. Notify state and local authorities if an Emergency Action Level (EAL) has been exceeded.
- C. Direct the insertion of any withdrawn control rod.
- D. Direct the continued monitoring of the affected area by Control Room personnel to determine the extent of the radiation problem.

**ANSWER: A**



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 4
	K/A#	GEN 2.4.11	
	Importance Rating		3.6
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B / C / D – Although each of these is a possible answer; they are not an Immediate Action specified in ONI-D17 that an SRO is required to complete.			
Technical Reference(s): ONI-D17		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-D17A Obj F			
Question Source:	Bank #	<u>  497  </u>	(Note changes or attach parent)
	Modified Bank #	<u>          </u>	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>  99-004  </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>  X  </u>	
Comments (Why is it an upper level question): N/A			

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**QUESTION 25**

An Override step in PEI-B13, RPV Control (Non-ATWS) asks, "Can Suppression Pool temperature be maintained below HCL?" If the response is NO, then the PEI directs the RPV be rapidly depressurized using the Main Turbine Bypass Valves.

According to this Override step, the RPV must be depressurized \_\_\_\_\_.

- A.           when Suppression Pool average temperature equals HCL.
- B.           when Suppression Pool average temperature exceeds HCL.
- C.           when any one Suppression Pool temperature indicator exceeds HCL.
- D.           before Suppression Pool average temperature exceeds HCL.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 4
	K/A#	GEN 2.4.6	
	Importance Rating		4.0
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>In applying the 'Can/cannot be maintained above/below' statement, the current and future performance, trend and values must be considered. "Cannot" does not imply the actual value must exceed the limit.</p> <p>A / B – "cannot be maintained below" indicates the action should be taken before the value exceeds the limit.</p> <p>C – average SP temperature must be used to make this decision, not a single indicator.</p>			
Technical Reference(s): PEI-B13, RPV Control (Non-ATWS), PEI Bases Document		Reference Attached: <input checked="" type="checkbox"/> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-005-04a Obj F			
Question Source:	Bank # _____ Modified Bank # _____ New <input checked="" type="checkbox"/>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <input checked="" type="checkbox"/> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 _____ 55.43 <input checked="" type="checkbox"/>		
Comments (Why is it an upper level question): N/A			

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**QUESTION 26**

An electrical transient has occurred and Service Water Pump 'D' is lost. Which bus normally powers this pump?

- A. Bus H12
- B. Bus XH12
- C. Bus XH21
- D. Bus XH22

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A#	400000 K2.01	
	Importance Rating	2.9	3.0
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Bus H12 is the power supply to SW Pump A B – Bus XH12 is the power supply to SW Pump B D – Bus XH22 is the previous power supply to SW Pump D (before DCP)			
Technical Reference(s): DCP 99-5019		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-P41 Obj. C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): NA			

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**QUESTION 27**

The reactor power 8-hour average limit is 3700 MWt.

What is the basis for this limitation?

- A. To prevent exceeding the maximum steady state Main Generator real load.
- B. To prevent exceeding the maximum steady state licensed reactor power level.
- C. To minimize Recirculation Flow Control Valve (FCV) oscillations.
- D. To minimize Main Turbine Control Valve oscillations.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	GEN 2.1.32 / 241000	
	Importance Rating	3.4	3.8
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Max steady state Main Gen load is determined by Gen Capability Curve. B – Max steady state licensed reactor power level is 3758 MWt. C – Recirc FCV operation is capable of supporting the licensed reactor power level of 3758 MWt.			
Technical References: IOI-3		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): None			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to understand the basis for the Admin limit (even though the licensed max steady state power is 3758 MWt). Reworded basis from 'optimize main turbine control valve response' to equivalent 'minimize main turbine control valve oscillations',			

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**QUESTION 28**

The following plant conditions exist:

- An ATWS is in progress
- HPCS injection prevention has been performed per PEI-SPI-5.1
- RPV level is being maintained at + 75 inches

A loss of Bus EH13 occurs.

Which one of the following describes the response of the HPCS Pump breaker?

- A. The HPCS Pump breaker remains closed at all times.
- B. The HPCS Pump breaker remains open at all times.
- C. The HPCS Pump breaker initially opens and, upon re-energization of Bus EH13, re-closes after a 10 second time delay.
- D. The HPCS Pump breaker initially opens and, upon re-energization of Bus EH13, re-closes immediately.

**ANSWER: A**



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A#	295003 AK2.04	
	Importance Rating	3.4	3.5
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B – HPCS Pump breaker remains closed at all times because there is no UV trip.</p> <p>C – Same as above / 10 second TD pertains to a LOCA with power available to the pump.</p> <p>D – During HPCS injection prevention, the HPCS pump is not overridden off, rather the HPCS injection valve is overridden closed.</p>			
Technical Reference(s): SDM-E22B		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-E22A Obj E			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  </u> (C)	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): Requires student to predict the response of the HPCS Pump breaker based on given plant conditions.			

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QUESTION 29

IMMEDIATELY following a reactor scram from full power, what would be the expected indication observed on the Intermediate Range Monitors?

- A. Range 3 due to delayed neutrons dominating from longer-lived delayed neutron precursors.
- B. Range 3 due to delayed neutrons dominating from shorter-lived delayed neutron precursors.
- C. Range 5 due to delayed neutrons dominating from shorter-lived delayed neutron precursors.
- D. Range 5 due to delayed neutrons dominating from longer-lived delayed neutron precursors.

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295006 AA1.05	
	Importance Rating	4.2	4.2
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Range 3 is the range the IRMs are set to when the IRM detectors have been withdrawn from the core during reactor startup.</p> <p>B – Range 3 is the range the IRMs are set to when the IRM detectors have been withdrawn from the core during reactor startup.</p> <p>C – Delayed neutrons from shorter-lived DNP's dominate the neutron population.</p>			
Technical Reference(s): ONI-C71-1, GP Reactor Theory Text		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3001-003-08 Obj 17, OT-3035-003-01 Obj A			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>          </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): NA			

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**QUESTION 30**

The plant is operating at 100% reactor power when all inboard Main Steam Line Isolation Valves inadvertently isolate. The MSIV closure signal to the Reactor Protection System (RPS) failed to scram the reactor

Which one of the following describes the response of the reactor?

Assume **NO** operator action is taken.

- A. Reactor power will increase and stabilize at a higher power.  
RPV water level will decrease and return to normal level.
- B. Reactor power will increase and cause a reactor scram on power.  
RPV level will decrease and then stabilize at a higher level.
- C. Reactor power will decrease and stabilize at a lower power.  
RPV water level will increase and then return to normal level.
- D. Reactor power will increase and cause a reactor scram on power.  
RPV water level will increase and then return to normal level.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295007 AA2.03	
	Importance Rating	3.7	3.7
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Reactor power will decrease due to scram on high power.</p> <p>C – Reactor power will not stabilize at a lower power due to scram.</p> <p>D – Reactor water level will not increase (decreases due to void collapse following scram) and will stabilize at a higher level due to ECCS injection.</p>			
Technical Reference(s): AT&AA Text Chapter 2 (USAR 15B.5.2.2)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3401-005-12 Obj A			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  </u> (A)	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): Requires student to predict a plant wide response based on a single event (MSIV closure).			

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**QUESTION 31**

The plant was operating at 50 % power with both RFPTs on the Master Level Controller when a Feedwater rupture in the Turbine Building caused reactor water level to decrease.

Reactor water level decreased to + 80 inches before HPCS and RCIC were able to restore reactor water level to normal.

Which one of the following correctly describes the status of the Recirculation System?

- A. Recirculation Pumps are tripped with their flow control valves in their pre-transient positions.
- B. Recirculation Pumps are in slow speed with their flow control valves in their pre-transient positions.
- C. Recirculation Pumps are tripped with their flow control valves locked up (motion inhibited).
- D. Recirculation Pumps are in slow speed with their flow control valves locked up (motion inhibited).

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295009 AA1.03	
	Importance Rating	3.0	3.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B – Recirculation Pumps trip off at RPV Level 2 (+130 inches).</p> <p>C – There is no given condition that would cause the FCVs to lock up.</p> <p>D - Recirculation Pumps trip off at RPV Level 2 (+130 inches) and there is no given condition that would cause the FCVs to lock up.</p>			
Technical Reference(s): SDM-B33, SDM-B21(NBPI)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-B33 Obj E, OT-3036-004-B21(NBPI) Obj B			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to recognize the response of the Recirculation System to a decreasing reactor water level.			

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**QUESTION 32**

The plant is at 100% power. Since the beginning of shift, Control Room Operators have observed the following Drywell parameter trends:

- |                                      |            |
|--------------------------------------|------------|
| • Drywell Pressure:                  | Increasing |
| • Drywell Average Temperature        | Increasing |
| • Drywell Air Cooler Drain Flow Rate | Increasing |
| • Drywell Floor Drain Sump Fill Rate | Increasing |

Which one of the following could be the cause of these indications?

- A.           There is an accumulator air leak on an inboard MSIV.
- B.           There is a cooling coil leak on the lower drywell cooler air handling unit.
- C.           There is an instrument line leak on a water level condensing chamber.
- D.           There is an outer seal leak on a Reactor Recirculation Pump.

**ANSWER: C**



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295010 AA2.05	
	Importance Rating	3.3	3.3
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – An instrument air leak will not cause DW temperature, DW air cooler drain flowrate and DW FDS fill rate to increase.</p> <p>B – A lower DW air cooler cooling coil leak will not cause DW pressure, DW temperature, and DW air cooler drain flowrate to increase.</p> <p>D – A Recirculation Pump outer seal leak is conducted to the DW EDS and would not cause DW air cooler drain flowrate and DW FDS fill rate to increase.</p>			
Technical Reference(s): SDM-E31, TS 3.4.7		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-E31 Obj B&C , OT-3037-006-08 Obj B&C			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X  </u> (C) <u>  </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>      </u>		
Comments (Why is it an upper level question): Requires student to analyze each type of leak in order to determine if it is the cause of all the increasing drywell parameter trends.			

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**QUESTION 33**

An ATWS is in progress. The following plant conditions exist:

- Reactor power is 25%.
- Reactor pressure is at rated pressure.
- Reactor water level is at +180 inches and stable.

Which one of the following describes the effect of reducing reactor pressure?

- A. Reactor power will decrease due to the voiding of the core and remain lower than the original power.
- B. Reactor power will initially decrease due to the voiding of the core and then increase due to the lowering moderator temperature.
- C. Reactor power will increase due to the collapsing of the voids in the core resulting in increased neutron thermalization.
- D. Reactor power will decrease due to the concentration of boron in the core absorbing fast neutrons.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295015 AK1.04	
	Importance Rating	3.8	3.8
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Reactor power will increase due to the positive reactivity added by the lowering moderator temperature.</p> <p>C – Voids will not collapse when reactor pressure is lowered; voids will increase.</p> <p>D – There is no effect or relationship between reactor pressure and boron in the core. Also, boron absorbs thermal neutrons, not fast neutrons.</p>			
Technical Reference(s): GP Reactor Theory Text. PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3301-003-08 Obj 23 , OT-3402-004-04b Obj D			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X  </u> (A) <u>      </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>      </u>		
Comments (Why is it an upper level question): Requires student to predict final reactor power during an ATWS in response to changing core reactivity due to a reduction in reactor pressure (i.e., moderator temperature).			

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**QUESTION 34**

Concerning the operation of the MSL & MSIV BYP OTBD ISOL, 1B21-F019, local transfer switches located at MCC EF1A07, select the correct statement.

- A. Switches are not active until control transfer to the Division 1 Remote Shutdown Panel is completed.
- B. Switches are not active until the control transfer to the Division 2 Remote Shutdown Panel is completed.
- C. Switches are always active and if placed in EMERGENCY, will cause 1B21-F019 to close on an MSIV isolation signal.
- D. Switches are always active and if placed in EMERGENCY, will cause 1B21-F019 to close (if open).

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A#	295016 AK2.02	
	Importance Rating	4.0	4.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A and B – Switches are always active and do not require control to be transferred to either Remote Shutdown Panel.</p> <p>C – In EMERGENCY, there are no contacts in the valve 'close' logic for an MSIV isolation signal.</p>			
Technical Reference(s): SDM-C61		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-C61 Obj B&E			
Question Source:	Bank # Modified Bank # New	B-135_ _____ _____	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	_____ _____	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	_____ <u>  X  </u> (C)_	
10 CFR Part 55 Content:	55.41 55.43	<u>  X  </u> _____	
Comments (Why is it an upper level question): Requires student to understand the operation of the local transfer switches and their affect on valve position.			

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**QUESTION 35**

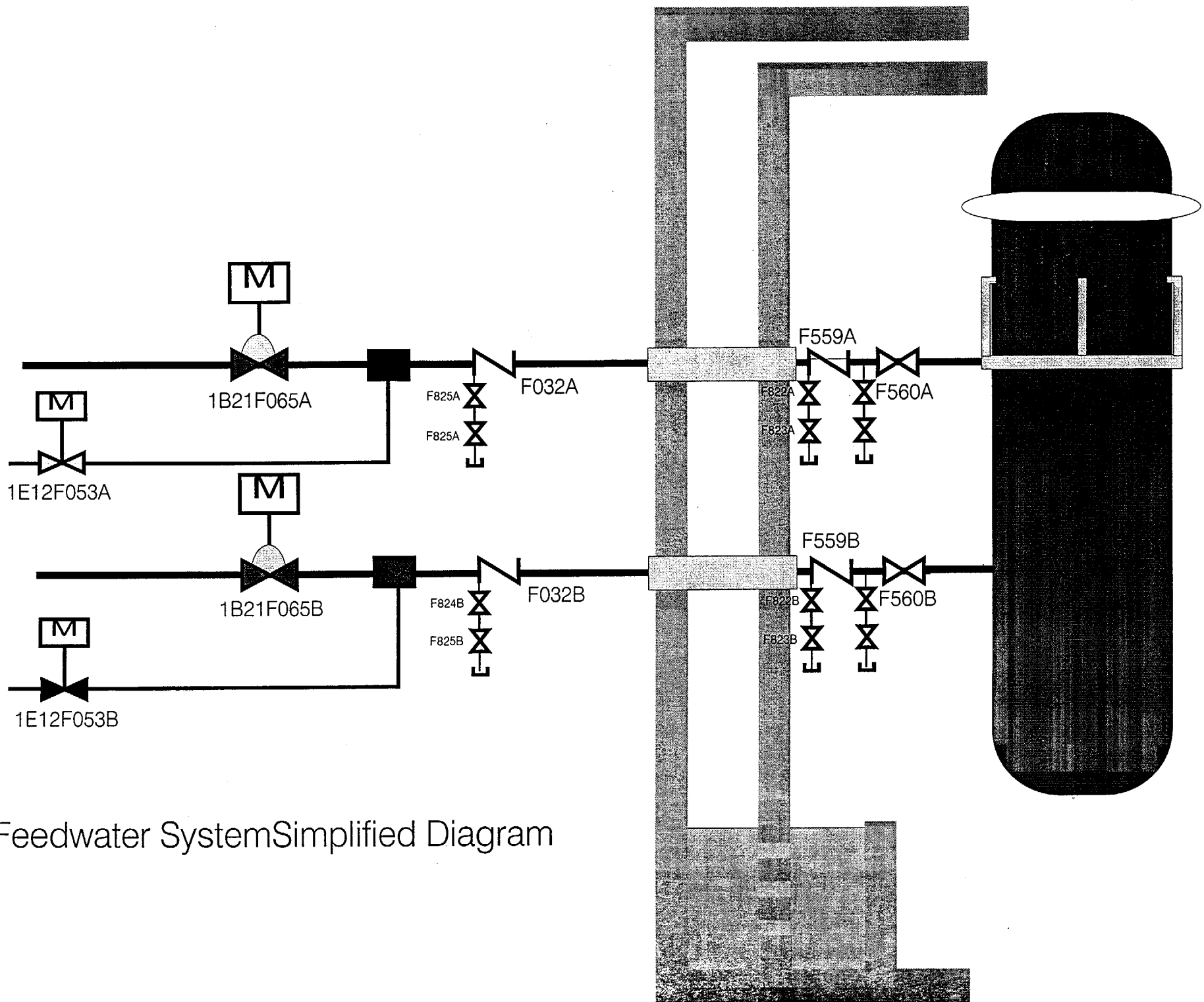
The Feedwater Leakage Control System has been initiated following a Loss of Coolant Accident when the Feedwater System was no longer required for adequate core cooling.

Which one of the following describes the location where the Feedwater Leakage Control System injects seal water?

**A simplified diagram of the Feedwater System is attached.**

- A. Between the inboard (F559A/B) and the outboard (F032A/B) feedwater check valves.
- B. Between the outboard feedwater check valves (F032A/B) and the feedwater header shutoff valves (F065A/B).
- C. Through the bonnets of the shutdown cooling to feedwater shutoff valves (E12-F053A/B).
- D. Through the bonnets of the feedwater header shutoff valves (F065A/B).

**ANSWER: D**



<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A#	GEN 2.1.28 / 295038	
	Importance Rating	3.2	3.3
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – This is the injection location of the previous inboard FWLCS.</p> <p>B – This is the injection location of the previous outboard FWLCS.</p> <p>D – Incorrect valve bonnet location.</p>			
Technical Reference(s): SDM-N27		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: Simplified diagram of the Feedwater System			
Learning Objective (As available): OT-3036-004-N27 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): NA			



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**QUESTION 36**

Fuel element failure is indicated by increasing plant radiation levels.

Upscale alarms are received on all Main Steam Line Radiation Monitors.

Upscale Trip alarms are received on Main Steam Line Radiation Monitors A and B.

Which one of the following action(s) will automatically occur based on these indications only?

- A. Off-Gas Discharge Isolation Valve N64-F632 closes.
- B. Reactor Water Sample Isolation Valves B33-F019 and B33-F020 close.
- C. Main Steam Line Isolation Valves B21-F022A-D and B21-F028A-D close.
- D. Mechanical Vacuum Pump Suction Valves N62-F130A and N62-F130B close.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A#	295017 AA1.06	
	Importance Rating	3.2	3.2
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Isolation signal for N64-F632 comes from OG Post-Treat Rad Monitor.</p> <p>B – B33-F019 logic is channels B and C and B33-F020 logic is channels A and D (inbd-outbd logic).</p> <p>C – MSIVs do not isolate on MSL high rad.</p>			
Technical Reference(s): SDM-N62 , SDM-D17A		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-N62 Obj D, OT-3036-004-D17A Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to predict the correct system response based on a high MSL radiation condition.			

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**QUESTION 37**

Describe the safety function of the Containment Ventilation Exhaust Radiation Monitor (D17-K609A-D) during a refueling outage.

- A. Detect a fuel bundle rupture inside Containment which causes the CVDWP (M14) System to isolate to ensure off-site dose limits are not exceeded.
- B. Detect a fuel bundle rupture outside Containment which causes the CVDWP (M14) System to isolate to ensure off-site dose limits are not exceeded.
- C. Detect a fuel bundle rupture inside Containment which causes the CVDWP (M14) System to isolate to ensure on-site dose limits are not exceeded.
- D. Detect a fuel bundle rupture inside Containment which actuates the Containment Evacuation alarm to ensure personnel evacuate Containment.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	3	1
	K/A#	295023 AK3.02	
	Importance Rating	3.3	3.6
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B – Rad monitor detects fuel bundle rupture inside Containment (not outside i.e., FHB).</p> <p>C – LCO Bases and USAR analysis is for off-site dose limits, on-site dose limits for personnel are not specifically analyzed.</p> <p>D – Containment Evacuation alarm is activated by the ABRM System (D17) (Either the CVDWP Exhaust ABRM or Containment Atmosphere ABRM).</p>			
Technical Reference(s): SDM-D17A , TS 3.3.6.1 Bases , USAR 15.7.6		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-D17A Obj D , OT-3037-005-07 Obj G			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>          </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): NA			

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REACTOR OPERATOR**

**QUESTION 38**

Which one of the following describes the bases for the 'Drywell Pressure-High' function for the Reactor Protection System Instrumentation?

- A. Decrease the probability of fuel damage during an Anticipated Transient Without Scram.
- B. Decrease the probability of fuel damage during a break in the Reactor Coolant Pressure Boundary.
- C. Decrease the amount of energy transferred to the coolant and Drywell during an Anticipated Transient Without Scram.
- D. Increase the amount of energy transferred to the coolant and Drywell during a break in the Reactor Coolant Pressure Boundary.

ANSWER: B
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<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295024 EK3.06	
	Importance Rating	4.0	4.1
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A / C– No relation to an ATWS condition; high drywell pressure is indication of a LOCA. D – Scram reduces the amount of energy transferred, it does not cause the amount of energy transferred to increase			
Technical Reference(s): SDM-C71, LCO 3.3.1.1 Bases		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-C71 Obj F, OT-3037-005-07 Obj G			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question):			

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**QUESTION 39**

Alternate Rod Insertion (ARI) on high reactor pressure counteracts the reactor pressure increase by reducing reactor power.

Which one of the following describes the bases for Alternate Rod Insertion due to high reactor pressure?

- A. ARI reduces the challenge to the integrity of the Reactor Coolant Pressure Boundary.
- B. ARI reduces the capability to cool the reactor fuel.
- C. ARI reduces unwanted safety relief valve operation resulting in undesired voiding of the core.
- D. ARI reduces unwanted safety relief valve operation resulting in undesired heatup of the Suppression Pool.

ANSWER: A
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<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1	1		
	Group #	1	1		
	K/A#	295025 EK3.06			
	Importance Rating	4.2	4.4		
Proposed Question: See attached					
Proposed Answer: See attached					
<p>Explanation (Why the distractors are incorrect):</p> <p>B – low water level threatens adequate core cooling.</p> <p>C/D – SRV operations are 'wanted'; the purpose of ARI is not to deter independent operation of the SRVs on high reactor pressure.</p> <p>*The key words are 'high reactor pressure'. All the RRCS control signals are meant to reduce reactor power which causes reactor pressure to decrease which, in turn, reduces the probability</p>					
Technical Reference(s): SDM-C22, LCO 3.3.1.1. Bases, LCO 3.3.4.2 Bases		Reference Attached: <u>  X  </u> (Attach if not previously provided)			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3036-001-C22 Obj A & B, OT-3037-005-07 Obj G					
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)			
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____				
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____				
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____				
Comments (Why is it an upper level question): NA					



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**QUESTION 40**

The following plant conditions exist:

- Reactor power 5%
- Reactor level -10 inches using LPCI 'A' outside the shroud
- Reactor pressure 20 psig
- Supp Pool temperature 75 degrees F
- Supp pool level 19 feet 4 inches

During a walkdown of panel H13-P601, the Control Room operator notes that RHR Pump 'A' amps and discharge pressure is wildly fluctuating.

These indications for RHR Pump 'A' indicate \_\_\_\_\_.

- A. pump runout
- B. pump seizure
- C. pump cavitation
- D. pump seal leakage

ANSWER: C
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<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A#	295026 EK1.01	
	Importance Rating	3.0	3.4
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – pump runout indications are high amps and high flow (steady).</p> <p>B – Pump seizure indications are zero amps and discharge pressure.</p> <p>D – Pump seal leakage indications would not be observable on the pump amp and discharge pressure meters.</p>			
Technical Reference(s): Supp Pool Temperature PEI Bases, GP Components Text		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3303-003-02 Obj 3, OT-3402-004-06 Obj B			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze the abnormal indications to determine the cause. Increasing Supp Pool temperature reduces pump suction temperature creating conditions for pump cavitation.			

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**QUESTION 41**

The plant is shutting down to perform maintenance. Because of fuel cladding leaks, plant management has decided not to scram the reactor, but rather, to conduct a controlled insertion of control rods to minimize the potential increase in radioactivity release from the fuel.

As rod insertion progresses, the reactor goes subcritical. The Control Room Operator stops insertion of control rods with the intent to slow down the reactor depressurization and cooldown. Practically all of the heat generation at this point is from decay heat.

Thirty (30) minutes later the Control Room Operator notes that IRM flux levels are increasing on a long, stable positive reactor period.

Which one of the following describes the next action the Control Room Operator should take?

- A. Insert control rods to a position that causes reactor period to be 60 – 150 seconds.
- B. Withdraw the next in-sequence control rod to maintain the power rise to reach the point of adding heat.
- C. Manually scram the reactor to terminate the power rise.
- D. Monitor IRMs and range them according to the power increase to keep them on-scale.

ANSWER: C
-----------

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295014 AK3.01	
	Importance Rating	4.1	4.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A- Recommended reactor period range during a reactor startup and criticality per IOI-1.</p> <p>B – Possible operator actions during a startup and criticality, but not for an inadvertent criticality during a plant shutdown.</p> <p>D – Possible operator actions during a startup and criticality, but not for an inadvertent criticality during a plant shutdown.</p>			
Technical Reference(s): Limerick Event 4/9/88 , IOI-4 Caution, PAP-0201, Section 6.4.5		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3046-000-09a Obj A, OT-3038-008-02 Obj A			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X  </u> (A)	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>      </u>		
Comments (Why is it an upper level question): Requires student to make a decision (manually scram the reactor) based on plant indications for an inadvertent criticality during shutdown.			

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**QUESTION 42**

A Loss of Coolant Accident (LOCA) has occurred. From the conditions below, select the set of conditions that would preclude the use of one or more ranges of RPV Water Level Instrumentation to determine reactor water level.

- |    |                         |         |
|----|-------------------------|---------|
| A. | Reactor Pressure        | 0 psig  |
|    | Drywell Temperature     | 190 °F  |
|    | Containment Temperature | 215 °F  |
|    |                         |         |
| B. | Reactor Pressure        | 0 psig  |
|    | Drywell Temperature     | 190 °F  |
|    | Containment Temperature | 145 °F  |
|    |                         |         |
| C. | Reactor Pressure        | 50 psig |
|    | Drywell Temperature     | 205 °F  |
|    | Containment Temperature | 160 °F  |
|    |                         |         |
| D. | Reactor Pressure        | 50 psig |
|    | Drywell Temperature     | 160 °F  |
|    | Containment Temperature | 210 °F  |

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	1	1		
	Group #	2	1		
	K/A#	295027 EK2.02			
	Importance Rating	3.2	3.3		
Proposed Question: See attached					
Proposed Answer: See attached					
Explanation (Why the distractors are incorrect): B/C/D – Both Drywell and Containment temperatures are less than the RPV saturation temperature (212 degrees for o psig).					
Technical Reference(s): PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3402-005-01 Obj D					
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)			
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____				
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>				
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____				
Comments (Why is it an upper level question): Requires student to recognize that all water level instrument indications are invalid above saturation temperature for RPV pressure. Student must analyze the information and recognize that Containment temperature above 212 degrees F satisfies this condition.					

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**QUESTION 43**

Plant Emergency Instruction PEI-13, RPV Control (ATWS) specifies that, under certain conditions, injection into the RPV be terminated and prevented except for boron and CRD.

The reason that injection into the RPV is terminated and prevented is to \_\_\_\_\_.

- A.           DECREASE the suppression pool heatup rate.
- B.           DECREASE the rate and magnitude of power oscillations.
- C.           INCREASE the thermal driving head.
- D.           INCREASE core inlet subcooling.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295031 EK1.03	
	Importance Rating	3.7	4.1
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B – Lowering water level is expected to increase power oscillations (PEI- Bases). C – Lowering water level will decrease thermal driving head. D – Lowering water level will decrease core inlet subcooling.			
Technical Reference(s): PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-006-11 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question):			



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**QUESTION 44**

Following a turbine trip at 40% reactor power, reactor pressure spiked to 1095 psig and then immediately decreased to 960 psig. The reactor did NOT scram.

Assuming control rods did NOT insert but all other systems performed as designed, what plant conditions would be observed 10 seconds after the turbine trip?

- A. Feedwater flow controllers in MANUAL, Reactor Recirculation pumps operating in SLOW speed with pump breakers CB 3A/B and CB 4A/B CLOSED.
- B. Feedwater flow controllers in MANUAL, Reactor Recirculation pumps TRIPPED off with pump breakers CB 3A/B and CB 4A/B OPEN.
- C. Feedwater flow controllers in AUTO, Reactor Recirculation pumps operating in SLOW speed with pump breakers CB 3A/B and CB 4A/B OPEN.
- D. Feedwater flow controllers in AUTO, Reactor Recirculation pumps operating in SLOW speed with pump breakers CB 3A/B and CB 4A/B CLOSED.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295037	EK2.02
	Importance Rating	4.0	4.2
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – There is no FWRB and Breakers CB 3A/B and CB 4A/B will be open.</p> <p>B – There is no FWRB and Recirc Pumps will be running in Slow speed.</p> <p>D - Breakers CB 3A/B and CB 4A/B will be open.</p> <p>*The 25 second time delay has not timed out so the FWRB and Recirc Pump trip to off will not occur yet</p>			
Technical Reference(s): SDM-C22		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-001-C22 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to predict the plant response that should have occurred based on the given conditions.			

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**QUESTION 45**

Following a LOCA, the following plant conditions exist:

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| • RPV water level                    | 35 inches                            |
| • Containment pressure               | 10 psig                              |
| • Containment hydrogen concentration | 8.7%                                 |
| • Drywell hydrogen concentration     | 8.9%                                 |
| • Hydrogen igniters                  | Failed to operate in either division |

What is the hydrogen control equipment configuration required under these conditions?

**PEI-M51/56, Hydrogen Control, flowchart is provided for reference.**

- A. Combustible Gas Mixing System OPERATING; Hydrogen Recombiners OPERATING.
- B. Combustible Gas Mixing System SECURED; Hydrogen Recombiners OPERATING.
- C. Combustible Gas Mixing System OPERATING; Hydrogen Recombiners SECURED.
- D. Combustible Gas Mixing System SECURED; Hydrogen Recombiners SECURED.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	500000 EK1.01	
	Importance Rating		3.9
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – The CGMS and Hydrogen Recombiners are required to be secured. B - Hydrogen Recombiners are required to be secured. C - CGMS is required to be secured.			
Technical Reference(s): PEI-M51/56		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: PEI-M51/56 Flowchart			
Learning Objective (As available): OT-3402-006-10 Obj C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): Given PEI-M51/56, students are required to analyze plant conditions and determine the actions to be taken.			

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QUESTION 46

During a Main Turbine trip, reactor pressure peaked at 1115 psig. The reactor scrammed and reactor pressure is now 900 psig.

Select the item that describes the operation of the Safety Relief Valves (SRVs) during and following this transient.

Assume **NO** operator action is taken with respect to the SRVs.

- A. One SRV opened and remained open until pressure decreased to 936 psig. If pressure increases to 1100 psig, one SRV will re-open.
- B. Ten (10) SRVs opened. One SRV remained open until pressure decreased to 926 psig. If pressure increases to 1100 psig, two SRVs will re-open.
- C. Ten (10) SRVs opened. Ten (10) SRVs remained open until pressure decreased to 936 psig. If pressure increases to 1100 psig, one SRV will re-open.
- D. Nineteen (19) SRVs opened. Ten (10) SRVs remained open until pressure decreased to 936 psig. If pressure increases 1100 psig, two SRVs will re-open

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A#	295025 EA1.03	
	Importance Rating	4.4	4.4
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A/C/D – Ten SRVs will open (one at 1103 and 9 at 1113 psig). One Low-Low Set SRV will remain open until pressure decreases to 926 psig. If pressure increases to 1100 psig, then 2 SRVs will re-open (one at 1033 and one at 1073 psig).</p>			
Technical Reference(s): SDM-B21/N11		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-B21/N11 Obj E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X(C)  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to apply knowledge of SRV relief setpoints and Low-Low Set logic to given conditions.			

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**QUESTION 47**

Plant Conditions are as follows:

- |                                |                               |
|--------------------------------|-------------------------------|
| • Reactor is shutdown          | all rods are in               |
| • Reactor pressure             | 600 psig                      |
| • Reactor water level          | 210 inches                    |
| • Suppression Pool temperature | 115°F                         |
| • Suppression Pool level       | 14.0 feet                     |
| • Drywell pressure             | 1.1 psig                      |
| • Containment pressure         | 0.8 psig                      |
| • RHR Loops A and B            | Suppression Pool Cooling mode |

What action is required to be performed?

- A. Reduce reactor pressure to provide a wider operating margin to HCL.
- B. Spray Containment.
- C. Emergency Depressurize.
- D. These conditions require no further actions be initiated.

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A#	295030 EA2.02	
	Importance Rating	3.9	3.9
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A - Plant conditions do not require that reactor pressure be reduced to maintain below HCL. Rather, emergency depressurization is required due to SP level &lt; 14.25 ft.</p> <p>B - Plant conditions do not require Containment to be sprayed. Rather, emergency depressurization is required due to SP level &lt; 14.5 ft.</p> <p>D - Plant conditions require emergency depressurization to be performed.</p>			
Technical Reference(s): PEI-T23, Containment Control, PEI-B13, RPV Control (Non-ATWS), PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: PEI-T23, Containment Control, PEI-B13, RPV Control (Non-ATWS)			
Learning Objective (As available): OT-3402-005-05 Obj C, OT-3402-004-06 Obj C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze plant conditions using the PEI flowcharts in order to determine that emergency depressurization is required.			



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QUESTION 48

The plant is operating at 100% reactor power when one Reactor Recirculation pump trips. All systems respond as designed to this event. How will RPV water level initially respond and what is the reason for this response?

RPV water level will \_\_\_\_\_.

- A. INCREASE due to the displacement of water into the downcomer by increased steam voiding.
- B. DECREASE due to the lack of coolant velocity to sweep voids into the steam separator.
- C. INCREASE due to the continuing addition of feedwater at 100% rated feedwater flow.
- D. DECREASE due to the runback of feedwater pumps to minimum speed.

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295001 AK3.01	
	Importance Rating	3.6	3.6
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B – RPV water level will initially increase, not decrease.</p> <p>C – RPV water level will initially increase but the fdw pumps will not remain at 100% feed flow due to the fdw level control circuitry.</p> <p>D - RPV water level will initially increase, not decrease.</p>			
Technical Reference(s): AT&AA Text Chapter 5 (USAR 15.3.1)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3401-005-12 Obj B			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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QUESTION 49

The plant is operating at 35% reactor power when the Control Room operators observe Main Condenser vacuum is decreasing (increasing absolute pressure) and Off-Gas System after-filter discharge flowrate is increasing.

Which one of the following could be the cause of these indications?

- A. Main Steam to Steam Jet Air Ejector supply pressure is less than 125 psig.
- B. Steam Seal header pressure is 1.0 psig.
- C. Steam Seal header pressure is 4.0 psig.
- D. Steam Seal exhaust vacuum is greater than 12.0 inches water vacuum.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295002 AK2.11	
	Importance Rating	2.6	2.7
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – This is an abnormally low Mn Stm to SJAE supply pressure which would cause the SJAE to be less efficient and extract less air from the Main Condenser, hence Off-Gas discharge flow rate would decrease.</p> <p>C – This is a normal Steam Seal header pressure.</p> <p>D – This is an abnormally high Steam Seal exhaust vacuum but would not contribute to a loss of Main Condenser vacuum.</p>			
Technical Reference(s): ONI-N62		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-001-N33 Obj E, OT-3036-003-N62, Obj E and I, OT-3035-001-05b Obj A			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41 55.43	<u>  X  </u> <u>          </u>	
Comments (Why is it an upper level question): Requires student to analyze indications and apply them to the Steam Seal System and Condenser Air Removal System in order to determine why condenser vacuum is degrading.			

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 50**

The plant is operating at 100% reactor power. A Maintenance Electrician reports that a Division 3 Battery pilot cell specific gravity is 1.188 (corrected for electrolyte temperature and level) and the specific gravity of one of the battery cells is 1.189.

Which one of the following Required Actions is the Unit Supervisor required to perform?

**Technical Specification Section 3.8 is provided for reference.**

- A. Declare the Division 3 Battery inoperable and be in MODE 4 within 37 hours.
- B. Verify pilot cell parameters are within the Table 3.8.6-1 Category C limits within 1 hour and once per 7 days thereafter, and restore battery cell parameters to Category A and B limits of Table 3.8.6-1 within 31 days.
- C. Verify pilot cell's electrolyte level and float voltage is within the Table 3.8.6-1 Category C limits within 1 hour and verify battery cell parameters meet Table 3.8.6-1 Category C limits within 24 hours and once per 7 days thereafter, and restore battery cell parameters to Category A and B limits of Table 3.8.6-1 within 31 days.
- D. Verify pilot cell's electrolyte level and float voltage and battery cell parameters meet the Table 3.8.6-1 Category C limits within 24 hours and once per 7 days thereafter, and restore battery cell parameters to Category A and B limits of Table 3.8.6-1 within 31 days.

ANS: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295004	AA2.03
	Importance Rating		2.9
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A - The battery is not inoperable, the Required Action is to verify pilot and cell conditions. B - The battery cell parameters must be verified within 24 hours and 7 days thereafter. D - Pilot cell electrolyte level is required to be checked within 1 hour.			
Technical Reference(s): Tech Spec 3.8.6		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: Tech Spec 3.8.6			
Learning Objective (As available): OT-3037-001-12 Obj C			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X  </u> (A)	
10 CFR Part 55 Content:	55.41 55.43	<u>      </u> <u>  X  </u>	
Comments (Why is it an upper level question): Requires student to interpret given battery cell information and then apply Tech Spec Conditions and Required Actions.			

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SENIOR REACTOR OPERATOR**

**QUESTION 51**

Plant conditions are as follows:

- |                 |        |
|-----------------|--------|
| • MODE          | MODE 1 |
| • Reactor power | 25 %   |

Which one of the following describes the response of the RC&IS System if the Main Turbine were to trip with no reactor scram?

RC&IS will \_\_\_\_\_.

- A. implement the constraints of the Rod Pattern Controller, and depending on the control rod pattern, initiate Insert and/or Withdraw blocks.
- B. implement the constraints of the Rod Withdrawal Limiter allowing control rods to be withdrawn up to 4 notches.
- C. Implement no constraints on control rod motion since reactor power is at the Low Power Alarm Point between the Rod Pattern Controller and the Rod Withdrawal Limiter.
- D. implement the constraints of the Rod Withdrawal Limiter allowing control rods to be withdrawn up to 2 notches.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	1	2
	K/A#	295005 AA1.03	
	Importance Rating	2.8	2.8
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B / C / D – when the Main Turbine trips, first stage shell pressure goes to zero psig. LPSP will initiate because sensed thermal power is < 20%.			
Technical Reference(s): SDM-C11(RCIS)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-C11(RCIS) Obj H			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze the plant conditions, recognize that reactor thermal power is equated to turbine first stage pressure, and then determine that RCIS will implement the constraints of the RPC when below the LPSP.			



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SENIOR REACTOR OPERATOR**

**QUESTION 52**

The plant was operating at 20% reactor power when a malfunction of the Feedwater Level Control System (C34) caused RPV water level to increase to 224 inches before Control Room Operators could restore RPV level back to normal.

Which one of the following is the plant response to this event?

- A. There would be no noticeable plant response at this reactor power level.
- B. Reactor power increased but reactor water level decreased due to shrink caused by the cold water injection. Reactor power and reactor water level returned to normal after approximately one minute.
- C. The Main Turbine tripped but the reactor did not scram.
- D. The Main Turbine tripped and the reactor scrambled.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295008 AK1.01	
	Importance Rating	3.0	3.2
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A/B/C – At RPV Level 8, the Main Turbine will trip to protect against excessive moisture carryover and the reactor will scram due to the expected power increase due to increased neutron moderation.</p>			
Technical Reference(s): SDM-C71, SDM-N32/C85, SDM-B21(NBPI)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-C71 Obj F, OT-3036-002-N32/C85 Obj I, OT-3036-004-B21(NBPI) Obj B			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41 55.43	<u>  X  </u> <u>          </u>	
Comments (Why is it an upper level question): Requires student to predict the plant response due to a high RPV level condition (causes high moisture carryover and increased power due to neutron moderation) while the plant is at power.			

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REACTOR OPERATOR**

**QUESTION 53**

A high containment temperature has occurred and the Control Room Operators have entered PEI-T23, Containment Control. The PEI directs the Control Room Operators to "operate all available containment cooling".

Plant conditions are as follows:

- No BOP isolation has occurred.
- CVCW Chiller 'A' is operating.
- CVCW Chill Water Pump 'A' is operating.
- Containment Vessel Cooling Fans 'A', 'C', 'D', and 'F' are operating.

What action can be taken to "operate all available containment cooling"?

- A. Start CVCW Chiller 'C'.
- B. Start CVCW Chill Water Pump 'C'.
- C. Start Containment Vessel Cooling Fans 'B' and 'E'.
- D. Manually close the CVCW three-way valve to isolate any chill water bypass flow around the Containment Vessel Cooling Air Handling Unit cooling coils.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295011 AK2.01	
	Importance Rating	3.7	4.0
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A/B – Only one CVCW chiller/chill water pump can be operation. Starting either CVCW chiller 'C' or chill water pump 'C' would cause CVCW chiller/chill water pump A to trip.</p> <p>D – CVCW three-way valves will already be in the full flow to the cooling coil position due to the high containment temperature condition.</p>			
Technical Reference(s): PEI-T23, PEI Bases Document, SDM-M11, SOI-M11		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-004-07 Obj C, OT-3036-005-M11 Obj F			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze plant conditions and determine the correct action to be taken in order to maximize containment cooling during a high containment temperature condition.			

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SENIOR REACTOR OPERATOR**

**QUESTION 54**

What condition will cause the standby fan in the Lower Drywell Cooler Air Handling Unit to automatically start?

- A. High Differential Pressure across the running fan.
- B. Low Differential pressure across the running fan.
- C. High temperature ( $>120^{\circ}\text{F}$ ) in the Reactor Vessel Skirt Area.
- D. High vibration on the running fan.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295012 AK2.02	
	Importance Rating	3.6	3.7
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – High d/p does not cause an auto start of the standby fan. C – High temperature does not cause an auto start of the standby fan. D – High vibration does cause an alarm but does not cause an auto start of the standby fan.			
Technical Reference(s): SDM-M13		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-M13 Obj F			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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SENIOR REACTOR OPERATOR**

**QUESTION 55**

The plant is operating at 90% reactor power when both Nuclear Closed Cooling System Heat Exchanger temperature control valves malfunction. Plant operators are unable to operate the temperature control valves manually. The standby NCC Heat Exchanger is drained for maintenance. As a result, alarm NCC HX OUTLET TEMP HIGH is received and NCC Heat Exchanger outlet temperature is 86 °F and slowly increasing.

Which one of the following operator actions is required to be performed?

- A. Start an additional Service Water Pump.
- B. Enter PEI-T23, Containment Control.
- C. Perform a rapid manual shutdown of the Reactor Water Cleanup System.
- D. Close both Recirculation Loop A and B Flow Control Valves until total core flow is 58 Mlbm/hr.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295018 AK2.01	
	Importance Rating	3.3	3.4
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Starting an additional SW Pump is not an Immediate Action of ONI-P43 and should have no effect on NCC temperature control Since the TCVs are stuck in a fixed position.</p> <p>B – There are no PEI-T23 entry conditions specified in the given plant conditions.</p> <p>C – This is not an immediate operator action specified in ONI-P43.</p>			
Technical Reference(s): SOI-B33, ONI-P43		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-B33 Obj G, OT-3036-004-P43 Obj D & H			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  </u> (A)	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
<p>Comments (Why is it an upper level question): There is no direct guidance on this exact scenario, therefore the student must analyze the conditions and conclude that the proper action to take is the same as for a complete loss of NCC. Also, according to SOI-P43, NCC must be operated with a temperature of 89°F or less in order to be in compliance with the MSIV closure analysis although there doesn't appear to be a procedure directing any action if this temp is exceeded.</p>			



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SENIOR REACTOR OPERATOR**

**QUESTION 56**

With the plant at power, Instrument Air and Service Air header pressures are slowly decreasing. The following annunciators are received:

- INSTRUMENT AIR HEADER PRESSURE LOW
- PARALLEL IA AIR HEADER PRESSURE LOW
- SERVICE AIR HEADER PRESSURE LOW
- SA/IA XCONN CLOSE IA RECEIVER PRESSURE LOW

SA/IA XCONN VALVE, 1P52-F050, has automatically closed.

Which one of the following conditions will occur due to the low system air pressure?

- A. ADS SRVs will be inoperable.
- B. MSIVs will be inoperable.
- C. SDV Vent and Drain Valves will fail open.
- D. CRD drive water flow will increase.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295019 AA2.02	
	Importance Rating		3.7
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – ADS SRVs receive air from P57 system (safety related instrument air).</p> <p>C – SDV vent and drain valves will fail closed.</p> <p>D – CRD FCV will fail closed, therefore, CRD drive water flow will decrease.</p>			
Technical Reference(s): ONI-P52		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-P51/52 Obj E & G			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X(C)  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): Requires student to know the interrelationships between instrument air and safety related systems in conjunction with knowledge of various alarm setpoints and Tech Specs in order to arrive at the correct answer.			

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SENIOR REACTOR OPERATOR**

**QUESTION 57**

The following plant conditions exist:

- The reactor is in MODE 4
- RHR Loop A is in the Shutdown Cooling mode
- RHR Loop B is in the Suppression Pool Cooling mode

A valid RPV Level 1 reactor water level condition occurs.

Which one of the following describes the automatic response of the RHR system?

- A. RHR Pumps A and B trip; RHR Loop B shifts to the LPCI mode; RHR Pump B restarts.
- B. RHR Pump A trips; RHR Loop B continues to operate in the Suppression Pool Cooling mode.
- C. RHR Pump A trips; RHR Loop B realigns to the LPCI mode.
- D. RHR Pump A continues to operate in the Shutdown Cooling mode; RHR Loop B realigns to the LPCI mode.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295020 AK2.09	
	Importance Rating	3.1	3.3
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – RHR Pump B does not trip and then restart. B – RHR Loop B realigns to the LPCI mode. D – RHR Pump A trips.			
Technical Reference(s): SDM-E12		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-E12 Obj E & F			
Question Source:	Bank #	<u>  1279  </u>	
	Modified Bank #	<u>          </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>  99-006  </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>	
	Comprehension or Analysis	<u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): Requires student to predict the response of various E12 modes of operation when a valid RHR LOCA signal occurs.			

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SENIOR REACTOR OPERATOR**

**QUESTION 58**

IOI-12, Maintaining Cold Shutdown, specifies that when Reactor Recirculation Pumps are not operating, reactor water level should be maintained greater than 250 inches on the Reactor Shutdown Range Level.

Maintaining reactor water level in a range of 250 to 260 inches on the Reactor Shutdown Range Level will \_\_\_\_\_.

- A. prevent undetected boiling locally in the core.
- B. provide adequate NPSH for the RHR pumps during shutdown cooling operation.
- C. provide sufficient water volume to prevent a loss of shutdown cooling due to a low reactor water level isolation.
- D. provide sufficient water volume to flood the Main Steam lines.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	3	2
	K/A#	295021 AK1.04	
	Importance Rating	3.6	3.7
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B / C – these reasons are not given in IOI-12. D – Maintaining water level less than 272 inches will prevent flooding the MSLs.			
Technical Reference(s): IOI-12		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3046-003-01b Obj A			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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**QUESTION 59**

A reactor startup is in progress with reactor pressure at 650 psig when CRD Pump 'A' trips. While preparing to start CRD Pump 'B', four HCU accumulator faults are received; three of which are associated with withdrawn control rods. CRD charging water pressure is 1375 psig, as read on 1C11-R601, CRD PRESSURE CHARGING WATER.

Which one of the following operator actions is required to be performed?

- A. The Reactor Mode Switch must be placed in SHUTDOWN immediately.
- B. The Reactor Mode Switch must be placed in SHUTDOWN if the conditions above still exist after 20 minutes.
- C. A fast reactor shutdown must be commenced immediately.
- D. A fast reactor shutdown must be commenced if the conditions above still exist after 20 minutes.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295022 AK1.02	
	Importance Rating	3.6	3.7
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / C / D – Per Tech Specs, the Reactor Mode Switch need not be placed in SHUTDOWN immediately. Also, a fast reactor shutdown is not the method directed to be used to shutdown the reactor.</p>			
Technical Reference(s): ONI-C11-1, Tech Spec 3.1.5		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-006-05 Obj B & D, OT-3036-007-C11(CRDH) Obj G & H			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X  </u> (A)	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>      </u>		
Comments (Why is it an upper level question): Requires student to analyze plant conditions, and in conjunction with admin procedures and Tech Specs, apply the appropriate off-normal action.			



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SENIOR REACTOR OPERATOR**

**QUESTION 60**

PEI-T23, Containment Control, directs the operator to Emergency Depressurize if Suppression Pool level cannot be maintained below 24.5 feet.

Why does the PEI direct emergency depressurization at this point?

Above this Suppression Pool level, \_\_\_\_\_.

- A. the operation of SRVs may cause failure of the Containment.
- B. the pressure rise in the Containment could cause overflow of the weir wall.
- C. boron would be diluted below the Hot Shutdown Boron Weight if boron was being injected.
- D. the NPSH for pumps taking suction on the Suppression Pool would be insufficient.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	295029 EK3.01	
	Importance Rating	3.5	3.9
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B – this is a true statement but it is not the reason for ED. C – There is no relationship between ED due to high SP level and boron injection. D – This is the reason to ED if SP level cannot be maintained above 14.25 ft.			
Technical Reference(s): PRI-T23, PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-005-05 Obj C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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SENIOR REACTOR OPERATOR**

**QUESTION 61**

The plant is operating at 100% reactor power. AEGTS Train 'A' is in operation with its associated Annulus Differential Pressure Controller in the AUTO mode.

Which one of the following describes the response of AEGTS Train 'A' if the absolute pressure in the Annulus decreases below the desired pressure?

- A. The standby AEGTS Train 'B' will automatically start and restore Annulus pressure to the desired value.
- B. The associated Annulus Differential Pressure Controller setpoint will automatically increase to match the higher Annulus pressure.
- C. The AEGTS Train 'A' exhaust damper will throttle open while the recirculation damper will throttle close until the Annulus pressure is restored to the desired value.
- D. The AEGTS Train 'A' exhaust damper will throttle close while the recirculation damper will throttle open until Annulus pressure is restored to the desired value.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	3	2
	K/A#	295035 EA1.02	
	Importance Rating	3.8	3.8
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – For a high d/p (low absolute pressure) the standby train will not start.</p> <p>B – The controller tapeset value cannot automatically adjust itself.</p> <p>C – This will occur for a low d/p.</p>			
Technical Reference(s): SDM-M15		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-M15 Obj F			
Question Source:	Bank # Modified Bank # New	<u>  1361  </u> <u>          </u> <u>          </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>99-001_</u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X_(C)  </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): Requires student to predict the response of the AEGTS due to a change in Annulus pressure.			

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REACTOR OPERATOR**

**QUESTION 62**

PEI-N11, Containment Leakage Control, has been entered due to a high area water level in the LPCS Pump Room. A primary system is not discharging into the area.

Which one of the following is the EARLIEST time you are REQUIRED to shutdown the reactor?

- A. When there is a third entry condition into PEI-N11.
- B. When there is a second entry condition into PEI-N11 for the same plant parameter.
- C. When there is an entry condition and an area greater than its Maximum Safe Operating Conditions Value.
- D. When two areas for the same plant parameter are greater than their Maximum Safe Operating Conditions Value.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	3	2
	K/A#	295036	EK3.02
	Importance Rating	2.8	2.8
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A/B/C – The specific condition which must be satisfied in order to proceed past the HOLD step is 'two or more areas for the same plant parameter are greater than their Maximum safe Operating Conditions Value'. These answers do not satisfy that condition.			
Technical Reference(s): PEI-N11, PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-001-17 Obj C & D			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>          </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): N/A			

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SENIOR REACTOR OPERATOR**

QUESTION 63

A fire exists in Reactor Recirculation Pump 'A'. The fire was reported at 1358. The CNTMT CO<sub>2</sub> SUPPLY OUTBOARD ISOL VALVE, 1P54-F340, was opened by the Control Room Operators at 1440.

Which one of the following describes the current status of the CO<sub>2</sub> system?

CO<sub>2</sub> for the Reactor Recirculation Pump fire was \_\_\_\_\_.

- A. automatically released into the Drywell and was discharged for the required amount of time.
- B. automatically released into the Drywell and was not discharged for the required amount of time.
- C. not automatically released into the Drywell; therefore, the CO<sub>2</sub> System will need to be manually discharged.
- D. not automatically released into the Drywell; therefore, a Drywell entry will be required to suppress the fire.

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A#	GEN 2.4.27 / 600000	
	Importance Rating	3.0	3.5
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / B – The CO2 System will have timed out after 40 minutes, therefore, it will not automatically discharge once P54-F340 was opened.</p> <p>D – The CO2 System may still be manually initiated, therefore, a Drywell entry would not be required.</p>			
Technical Reference(s): ONI-P54		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-P54(WTR) Obj G, OT-3036-002-P54(CO2) Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to calculate the time period that has transpired in order to determine if the Recirc CO2 System automatically discharged for the minimum dump time or if a manual initiation will have to be performed.			



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REACTOR OPERATOR

QUESTION 64

When a control rod is selected, the Control Room Operator observes that the control rod has an "Insert Block" and "Insert Inhibit" light.

This means that the control rod **cannot** be \_\_\_\_\_.

- A. INSERTED since this might allow the LHGR or MCPR limit to be exceeded.
- B. INSERTED or WITHDRAWN since this might allow the LHGR or MCPR limit to be exceeded.
- C. INSERTED since this might allow a control rod to have excessive rod worth.
- D. INSERTED or WITHDRAWN since this might allow a control rod to have excessive rod worth.

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	201005 A2.03	
	Importance Rating	3.2	3.2
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – the control rod cannot be inserted but the reason is not due to LHGR or MCPR limits. B / D – the control rod cannot be inserted but it be withdrawn; the extra wording is plausible but does not change the fact that the control rod cannot be inserted.			
Technical Reference(s): SDM-C11(RCIS), SOI-C11(RCIS)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-C11(RCIS) Obj B & C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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REACTOR OPERATOR**

QUESTION 65

Given the following conditions for Reactor Recirculation Hydraulic Power Unit 'B':

- Subloop 1                      READY, LEAD, OPERATIONAL, PRESSURIZED
- Subloop 2                      READY

Alarm 'FCV B HPU NEEDS MAINTENANCE' is received at panel H13-P680.  
A Control Room Operator reports that an amber 'OIL WARM' light is illuminated on panel H13-P614 for HPU 'B'.

Which one of the following describes the operational status of HPU 'B'?

- A.                      Subloop 1 and Subloop 2 are in the Maintenance mode.
- B.                      Subloop 1 remains in operation and Subloop 2 remains in Standby.
- C.                      Subloop 1 is in the Maintenance mode and Subloop 2 is in operation but not in LEAD.
- D.                      Subloop 1 is in the Maintenance mode and Subloop 2 is in operation but is in LEAD.

ANSWER: D
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<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	202002 A3.02	
	Importance Rating	3.4	3.4
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – 'OIL HOT' would place both Subloops in the Maintenance mode. B – Subloop 1 shifts to Maintenance mode and Subloop 2 auto starts. C – Subloop 2 does shift to LEAD but LEAD light does not come on until operator depresses LEAD pushbutton (as directed by ARI actions).			
Technical Reference(s): SDM-B33, ARI-H13-P680-4(B5)		Reference Attached: <input checked="" type="checkbox"/> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-B33 Obj D&E			
Question Source:	Bank # _____ Modified Bank # _____ New <input checked="" type="checkbox"/>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <input checked="" type="checkbox"/> (C)		
10 CFR Part 55 Content:	55.41 <input checked="" type="checkbox"/> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze the response of the B33 HPU based on given conditions.			

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REACTOR OPERATOR**

**QUESTION 66**

The Control Room has been evacuated and plant control has been established at the Division 1 Remote Shutdown Panel.

Select the correct statement concerning operation of the Residual Heat Removal (RHR) System under these conditions.

- A.       The RHR PUMP A MIN FLOW VALVE, E12-F064A, will auto open when flow is less than 1650 gpm for 8 seconds when the RHR Pump is running.
- B.       The RHR A TEST VALVE TO SUPR POOL, E12-F024A, will auto close if a LPCI initiation signal is received.
- C.       The RHR A Pump, E12-C002A, will auto start if a LPCI initiation signal is received.
- D.       The RHR A TO RADWASTE ISOLATION VALVE, E12-F049, will auto close if drywell pressure is  $> 1.68$  psig.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	203000 K4.14	
	Importance Rating	3.6	3.7
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A/B/C – Interlock is bypassed when control is transferred to the Div 1 RSP.			
Technical Reference(s): IOI-11, Attachment 1, SDM-C61		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-C61 Obj B & E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X(C)  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to predict the response of RHR components from the Remote Shutdown Panel.			

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**QUESTION 67**

Assume that all required conditions have been met for an Automatic Depressurization AND that depressurization is in progress. If ALL the Low Pressure ECCS pumps trip off, which one of the following describes how the Automatic Depressurization System is affected?

- A. Automatic Depressurization will stop and can be recommenced by depressing the ADS Manual Initiation pushbuttons.
- B. Automatic Depressurization will stop and can be recommenced by restarting a Low Pressure ECCS pump.
- C. Automatic Depressurization will stop and can only be reestablished by manually opening SRVs.
- D. Automatic Depressurization will continue without interruption.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	209000 K3.02	
	Importance Rating	3.8	3.9
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A/B/C – Automatic Depressurization does not stop. Once the logic seals-in, loss of a low pressure ECCS pump has no effect on continued depressurization.			
Technical Reference(s): SDM-B21C (ADS)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-B21C Obj E			
Question Source:	Bank #	<u>  628  </u>	
	Modified Bank #	<u>          </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>	
	Comprehension or Analysis	<u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): Requires student to predict the response of the ADS based upon a loss of low pressure ECCS pumps.			



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**QUESTION 68**

If HPCS automatically initiates due to receipt of BOTH the Low Reactor water Level and High Drywell Pressure signals, the initiation signal will seal-in.

It may/will be reset \_\_\_\_\_.

- A. automatically when both initiation signals clear.
- B. manually only after both initiation signals clear.
- C. manually after the Low Reactor Water Level initiation signal clears.
- D. manually after the High Drywell Pressure initiation signal clears.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	209002 A4.15	
	Importance Rating	3.6	3.6
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Once sealed in, the logic must be manually reset.</p> <p>B and D – Only the Low Reactor water Level signal must clear before the logic can be reset.</p>			
Technical Reference(s): SDM-E22A		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-E22A Obj E			
Question Source:	Bank #	<u>  25  </u>	(Note changes or attach parent)
	Modified Bank #	<u>          </u>	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): N/A			

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QUESTION 69

The plant is operating at 35% reactor power. MSIV B21-F022A has a faulty limit switch which is generating a '< 92% open' signal.

Which one of the following MSIVs, if closed, would cause a ½ scram?

- A. MSIV B21-F028A
- B. MSIV B21-F028B
- C. MSIV B21-F022C
- D. MSIV B21-F028C

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	212000 K6.05	
	Importance Rating	3.5	3.8
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Combination of F022A and F028A will not de-energize RPS channel A or B to cause a ½ scram. C - Combination of F022A and F022C will not de-energize any RPS channel to cause a ½ scram. D - Combination of F022A and F028C will not de-energize any RPS channel to cause a ½ scram.			
Technical Reference(s): SDM-C71		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-C71 Obj F			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): Requires student, given initial conditions, to identify the condition that will cause a ½ scram to occur.			

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**QUESTION 70**

The following plant conditions exist:

- Reactor Mode Switch is in STARTUP/STANDBY
- Intermediate Range Monitors (IRM) A, C, D, E, and G are on Range 3; all other IRMs are on Range 2
- Source Range Monitor (SRM) A is reading 0.5 cps
- SRMs B and C are reading  $8.3 \times 10^4$
- SRM D mode switch is in STANDBY

A rod block signal has been generated.

Which one of the following has caused the rod block?

- A. SRM Upscale
- B. SRM Downscale
- C. SRM Detector Wrong Position
- D. SRM Inoperable

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	215004 A3.04	
	Importance Rating	3.6	3.6
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – NO SRMs are upscale ( $> 1 \times 10^5$ ). B – SRM A downscale is bypassed because associated IRMs A and E are on Range 3. C – No SRMs indicate $< 100$ cps with their detector not full in.			
Technical Reference(s): SDM-C51(SRM)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-C51(SRM) Obj D			
Question Source:	Bank #	B-1244	
	Modified Bank #	<u>          </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>	
	Comprehension or Analysis	<u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): Requires students to predict the response of the RC&IS given initial SRM conditions.			

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QUESTION 71

During reactor power operations, the following plant conditions exist:

- Reactor power 75%
- Core flow 70% (73 Mlbm/hr)
- Total Recirculation drive flow 65% (62 Kgpm)
- Recirculation Loops in operation Both

Which one of the following is the APRM Upscale Thermal Power Trip Setpoint?

- A. 84.3%
- B. 104.6%
- C. 106.9%
- D. 107.7%

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	215005 K4.07	
	Importance Rating	3.7	3.7
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Scram setpoint for single loop (.628W + 43.5% RTP). C – Scram setpoint for 2 loop operation before power uprate (.66W + 64% RTP). D – Incorrect to use core flow vice % recirc drive flow (.628W + 63.8%).			
Technical Reference(s): LCO 3.3.1.1 (RPS Inst), SDM-C51 (PRM)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-C51 (APRM) Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze the given conditions and solve the APRM thermal power flow biased scram setpoint equation. Note: due to power uprate, the equation changed from .66W + 64% to .628W + 63.8%.			



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**QUESTION 72**

The reactor is shutdown with the following plant conditions:

- Reactor water level                      255 inches on Shutdown Range Water Level
- Reactor water temperature            120 degrees F
- Reactor pressure                        0 psig
- Drywell temperature                    110 degrees F

Which one of the following is correct with respect to these plant conditions?

Actual reactor water level will be \_\_\_\_\_.

- A.            HIGHER than indicated since the reactor water temperature is LOWER than the calibration conditions for the Shutdown Range Water Level.
- B.            LOWER than indicated since the reactor water temperature is LOWER than the calibration conditions for the Shutdown Range Water Level.
- C.            LOWER than indicated since the drywell temperature is HIGHER than the calibration conditions for the Shutdown Range Water Level.
- D.            HIGHER than indicated since the drywell temperature is HIGHER than the calibration conditions for the Shutdown Range Water Level.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	216000 K5.07	
	Importance Rating	3.6	3.8
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A /B – reactor water temperature is at calibration conditions for SDR.</p> <p>D – drywell temperature is higher than calibration conditions, therefore, indicated <u>level</u> will be higher than <u>actual</u> level.</p>			
Technical Reference(s): SDM-B21(NBPI)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-B21(NBPI) Obj B			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)_____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to know the calibration conditions for the SDR level instrument and then predict how level indication will change.			

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**QUESTION 73**

A small break Loss of Coolant Accident (LOCA) has occurred. Per PEI-B13, RPV Control (Non-ATWS), HPCS injection has been secured and the MFP is being used to control RPV water level.

The Unit Supervisor wants to control RPV pressure using RCIC.

Which one of the following is correct concerning the operation of the RCIC System?

- A. RCIC cannot be operated in this mode unless Drywell pressure is less than 1.68 psig.
- B. RCIC should not be operated with a continuous pump flow less than 345 GPM when turbine speed is less than or equal to 2250 RPM due to turbine blade overheating.
- C. RCIC turbine operation less than 2000 RPM should be minimized to prevent cyclic action of the turbine exhaust check valve.
- D. RCIC turbine speed must be maintained greater than 2000 RPM to provide sufficient lubrication for internal pump components.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	217000 K5.06	
	Importance Rating	2.7	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – there is no restriction for operation of RCIC when drywell pressure is &gt; 1.68 psig.</p> <p>B – at &lt; 2250 RPM, RCIC continuous pump flow is limited to 140 GPM.</p> <p>D – RCIC speed must be maintained &gt; 1500 RPM to provide sufficient cooling of RCIC internal components.</p>			
Technical Reference(s): SOI-E51		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-E51 Obj F			
Question Source:	Bank # Modified Bank # New	<u>  B-835  </u> <u>          </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>          </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): N/A			

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SENIOR REACTOR OPERATOR

QUESTION 74

A Loss of Coolant Accident (LOCA) has occurred and Drywell pressure is 2.4 psig. LPCS is operating on minimum flow. LPCI A, B, and C have been overridden off since they were not required to maintain adequate core cooling.

Ten minutes after the initial Drywell break, RPV water level suddenly decreased below RPV Level 1. One hundred (100) seconds later, RPV water level was restored above RPV Level 3.

It has now been five minutes since RPV water level was restored above RPV Level 3 and the Unit Supervisor has directed the Supervising Operator to verify the current status of the Automatic Depressurization System (ADS).

**NO operator actions were taken with respect to ADS other than resetting annunciators that had cleared.**

Which one of the following is the correct annunciator status that the Supervising Operator should expect to observe?

	<b>ADS A 105 SEC TIME DELAY <u>LOGIC INITIATED</u></b>	<b>ADS A TIMER 90 <u>SEC &amp; RUNNING</u></b>	<b>ADS A INSTANTANEOUS <u>LOGIC INITIATED</u></b>
A.	ON	ON	ON
B.	OFF	ON	OFF
C.	ON	OFF	OFF
D.	OFF	OFF	ON

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	218000 A1.05	
	Importance Rating	4.1	4.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – the 105 and 90 second timer annunciators will have cleared when RPV level was restored above Level 1.</p> <p>B-the 90 second timer annunciator will have cleared when RPV level was restored above Level 3.</p> <p>C-the 105 second timer annunciator will have cleared when RPV level was restored above Level 3.</p>			
Technical Reference(s): SDM-B21C (ADS)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-B21C(ADS) Obj E			
Question Source:	Bank # _____	(Note changes or attach parent)	
	Modified Bank # _____		
	New <u>  X  </u>		
Question History:	Previous NRC Exam _____		
	Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____		
	Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u>		
	55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze the given events and conditions, and in conjunction with the ADS logic, determine the current status of the ADS System.			

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QUESTION 75

A Loss of Coolant Accident (LOCA) has occurred and Drywell pressure is 2.2 psig.

Based on these plant conditions, which one of the following describes the operation of the Containment Vacuum Relief Isolation Valves (M17-F015, F025, F035, and F045)?

If a Containment Vacuum Relief Isolation Valve control switch is \_\_\_\_\_.

- A. placed in OPEN, then the valve will open regardless of Containment pressure.
- B. placed in OPEN, then the valve will open only if Containment pressure is not positive.
- C. placed in CLOSE, then the valve will close regardless of Containment pressure.
- D. placed in CLOSE, then the valve will close only if Containment pressure is negative.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	223001 K5.01	
	Importance Rating	3.1	3.3
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – the isolation valves will not open if a positive pressure exists in Containment.</p> <p>C / D– the isolation valves will not close if a vacuum exists in Containment concurrent with a BOP LOCA signal.</p>			
Technical Reference(s): SDM-M17		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-M17 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			



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QUESTION 76

Given the following plant conditions:

- Drywell pressure is 1.3 psig
- Reactor water level is +105 inches
- Main condenser vacuum is 25 inches Hg A
- Reactor pressure is 75 psig

Which one of the following describes the system components that isolated based on these plant conditions?

- A. RWCU isolation valves, MSIVs and MSL Drain isolation valves, RCIC steam supply line isolation valves
- B. MSIVs and MSL Drain isolation valves, NCC Containment & Drywell isolation valves, RWCU isolation valves
- C. RCIC steam supply line isolation valves, Drywell Floor Drain Sump & Containment Drain Sump isolation valves, Reactor Water Sample isolation valves
- D. Reactor Water Sample isolation valves, RWCU isolation valves, MSIVs and MSL Drain isolation valves

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	223002 A3.02	
	Importance Rating	3.5	3.5
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A &amp; C – RCIC stm supply line isolation condition not met (reactor pressure &lt; 60 psig).</p> <p>B – NCC isolation valve isolation conditions not met (RPV level &lt; Level 1 or DW pressure &gt; 1.68 psig).</p>			
Technical Reference(s): SDM-B21(NS4)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-B21(NS4) Obj D,E,G,H , OT-3036-003-E51 Obj D , OT-3036-004-P51/52 Obj E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to predict various system isolation responses based on given plant conditions.			

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QUESTION 77

The plant has experienced a Loss of Coolant Accident (LOCA). All ECCS have operated as designed EXCEPT one Drywell pressure transmitter (B21-N094A) that supplies a high Drywell pressure signal to the Division 1 Containment Spray initiation logic. The transmitter has failed downscale (indicates zero).

Ten (10) minutes after the LOCA initiation signal, plant conditions are as follows:

- Drywell pressure                      1.9 psig
- Containment pressure              4.1 psig

Which one of the following describes the status of the Division 1 Containment Spray System?

Division 1 Containment Spray System has \_\_\_\_\_.

- A.              automatically initiated.
- B.              not automatically initiated but will initiate if the CNTMT SPRAY A MANUAL INITIATION pushbutton is armed and depressed.
- C.              not automatically initiated but will initiate if the CNTMT SPRAY A HI DW PRESS BYP keylock switch is placed in BYPASS.
- D.              not automatically initiated but will initiate if Containment pressure increases to 7.8 psig.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A#	226001 K6.08	
	Importance Rating	2.7	2.8
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – system has not automatically initiated because Containment pressure is less than 8.0 psig.</p> <p>C – bypassing the DW pressure (which already is greater than its setpoint) has no effect because Containment pressure is less than 8.0 psig.</p> <p>D - system will not automatically initiated until Containment pressure reaches 8.0 psig.</p>			
Technical Reference(s): SDM-E12		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-E12 Obj F			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze plant conditions, and in conjunction with the knowledge of Containment Spray logic, determine the impact of the failed DW pressure transmitter on the ability to initiate the system.			

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**QUESTION 78**

Reactor power is 90%.

Which one of the following describes how an SRV, that was stuck open, is verified closed after its control power fuses have been removed in accordance with ONI-B21-1, SRV Inadvertent Opening/Stuck Open?

- A. Reactor pressure increases.
- B. Main Generator electrical output increases.
- C. Indicated steam flow on the effected steam line decreases.
- D. Both SOLENOID STATUS A (B) red indicating lights on P601 are off

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	239002 A2.03	
	Importance Rating	4.1	4.2
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Reactor pressure will not change (maintained by the C85 pressure regulator).</p> <p>C – Indicated steam flow (measured downstream of the SRVs) on the affected steam line will increase because steam flow that was directed through the open SRV is now redirected down the MSL to the Main Turbine.</p> <p>D – De-energization of the SRV solenoids does not directly imply that the stuck open SRV closed,</p>			
Technical Reference(s): SDM-B21/N11, ONI-B21-1		Reference Attached: <input checked="" type="checkbox"/> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-B21/N11 Obj D, E, I			
Question Source:	Bank # _____ Modified Bank # _____ New <input checked="" type="checkbox"/>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <input checked="" type="checkbox"/> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <input checked="" type="checkbox"/> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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QUESTION 79

The plant is operating at 80% reactor power. Reactor Feed Pump Turbine (RFPT) 'A' and 'B' controllers are in Automatic when the High Pressure Core Spray (HPCS) System inadvertently initiates and injects into the RPV.

Which one of the following describes the response of the Feedwater Level Control System?

Total feedwater flow will \_\_\_\_\_.

- A.        decrease; resulting in a reactor scram on low reactor water level.
- B.        increase; reactor water level will stabilize at some level slightly lower than the tape set value.
- C.        decrease; reactor water level will stabilize at the same level as the tape set value.
- D.        decrease; reactor water level will stabilize at some level slightly higher than the tape set value.

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	259002 A1.02	
	Importance Rating	3.6	3.5
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>*At 80% power, fdw flow is approx. 24 kgpm. HPCS flow will be approx. 3 kgpm.</p> <p>A – FDW flow decreases to compensate for the HPCS flow; therefore, the reactor will not scram on low water level.</p> <p>B – FDW flow must decrease due to the water level error created by the additional water from HPCS</p> <p>C –Additional water from HPCS will create a level error; therefore, the actual water level cannot be the same as the tapeset value.</p>			
Technical Reference(s): SDM-C34		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-C34 Obj C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to predict how injection from the HPCS System will affect the FWLC System and feedwater flow.			



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**QUESTION 80**

A secondary flowpath associated with the Annulus Exhaust Gas Treatment System (AEGTS) allows a purge path to be established.

Which one of the following describes the purpose of this secondary flowpath?

- A. To control Drywell temperature during plant heatup.
- B. To control Drywell pressure during plant heatup.
- C. To control Drywell airborne radiation levels to allow Drywell entry during plant heatup.
- D. To control Drywell hydrogen concentration during a Loss of Coolant Accident (LOCA).

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	261000 K1.02	
	Importance Rating	3.2	3.4
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A/C/D – the only purpose for this secondary flowpath is for Drywell pressure control. The distractor purposes are not discussed in any plant reference document.			
Technical Reference(s): SDM-M15		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-M15 Obj B			
Question Source:	Bank #	<u>  1345  </u>	
	Modified Bank #	<u>          </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): N/A			

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QUESTION 81

The plant is at 15% reactor power. The Control Room Operator is in the process of synchronizing the Main Generator to the grid and is ready to close Generator Breaker S-610-PY-TIE. A malfunction occurs in the turbine control system and turbine speed increases to just below the Main Turbine overspeed trip setpoint.

Which one of the following describes how the plant will respond to this event?

- A. The synchroscope will turn clockwise at a slower rate; Main Generator output voltage will increase.
- B. The synchroscope will turn clockwise at a faster rate; Main Generator output voltage will not change.
- C. The synchroscope will turn counter-clockwise at a faster rate; Main Generator output voltage will decrease.
- D. The synchroscope will turn counter-clockwise at a faster rate; Main Generator output voltage will not change.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2	2		
	Group #	2	1		
	K/A#	262001 A4.02			
	Importance Rating	3.4	3.4		
Proposed Question: See attached					
Proposed Answer: See attached					
<p>Explanation (Why the distractors are incorrect):</p> <p>A/C – Synchroscope will turn at a faster rate in the CW direction if turbine speed increases and generator output voltage does not change because it is a function of the generator voltage regulator.</p> <p>D - Synchroscope will turn at a faster rate in the CW direction if turbine speed increases</p>					
Technical Reference(s): GP Components Text-Chapter 5, IOI-3		Reference Attached: <u>  X  </u> (Attach if not previously provided)			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3303-003-05 Obj 18 and 20 , OT-3046-003-05b Obj A					
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)		
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  (C)  </u>			
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>				
Comments (Why is it an upper level question): Requires student to predict the response of the generator synchroscope and generator output voltage based on an increase in main turbine speed during generator paralleling operations.					

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QUESTION 82

The Division 1 Diesel Generator is being operated in parallel with the grid. The Diesel Generator Control Transfer Switch is in the LOCAL position.

Which one of the following describes the response of the Division 1 Diesel Generator if a valid Loss of Coolant Accident (LOCA) signal occurs?

The Division 1 Diesel Generator output breaker will \_\_\_\_\_:

- A. not trip but the diesel generator trips normally bypassed by a LOCA signal will be bypassed.
- B. not trip and the diesel generator trips normally bypassed by a LOCA signal will not be bypassed.
- C. trip but the diesel generator trips normally bypassed by a LOCA signal will not be bypassed.
- D. trip and the diesel generator trips normally bypassed by a LOCA signal will be bypassed

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	264000 K4.07	
	Importance Rating	3.3	3.4
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – DG trips are not bypassed if a LOCA occurs while in Local control. C / D – DG breaker will not trip if a LOCA occurs while in Local control.			
Technical Reference(s): SDM-R43		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-R43/48 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X(C)  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to predict the response of the DG output breaker and the DG trips when operated locally and a LOCA occurs.			

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**QUESTION 83**

With the MG SET TRANSFER switch in the NORM position, RPS Motor Generator Set 'A' tripped off.

A full reactor scram will occur if a low reactor water level is sensed in which of the following RPS trip channel(s)?

- A. Channel 'A'
- B. Channel 'B'
- C. Channel 'C'
- D. Channels 'A' and 'C'

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A#	212000 A2.08	
	Importance Rating	4.1	4.2
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A / C / D – These channel(s) are already in a tripped condition due to loss of RPS Bus A (and a ½ scram condition exists in RPS Trip System A. For a full scram to occur, a low water level condition must be sensed by RPS channel B or D.			
Technical Reference(s): SDM-C71		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-C71 Obj D & F			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			



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**QUESTION 84**

The plant is operating at 100 % reactor power when Recirc Pump Seal Flow Regulator, 1C11-D012A, fails closed.

Which one of the following describes the potential consequence of this condition?

If Reactor Recirculation Pump A operation continues, then the \_\_\_\_\_.

- A. radioactivity discharged to Radwaste will decrease due to the reduced recirc pump seal purge flow.
- B. possibility of recirc pump seal damage will decrease due to the reduced recirc pump seal purge flow.
- C. possibility of recirc pump seal damage will increase due to the possible ingestion of dirt from an unclean piping system.
- D. possibility of recirc pump seal damage will increase unless the alternate recirc pump seal purge supply from the Condensate Transfer and Storage System can be lined up.

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	1	2
	K/A#	201001 K3.01	
	Importance Rating	3.0	3.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – loss of seal purge flow will increase the amount of radioactivity discharged to RW.</p> <p>B – loss of seal purge flow will increase the possibility of pump seal damage.</p> <p>D – Alternate seal purge flow from the CTS System can only be used when the reactor is shutdown and depressurized.</p>			
Technical Reference(s): SDM-B33, SDM-C11(CRDH)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-B33 Obj C, OT-3036-007-C11(CRDH) Obj B & C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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**QUESTION 85**

Reactor Recirculation Pumps 'A' and 'B' tripped off when reactor water level reached Level 2. Preparations are underway to restart Reactor Recirculation Pump 'A' in order to restore forced circulation through the core.

Which one of the following interlocks must be met for Reactor Recirculation Pump 'A' to successfully start and operate in slow speed?

- A.           RPV water level is greater than RPV Level 3.
- B.           Flow Control Valve 'A' actuator (D004A) is full open.
- C.           Differential temperature between reactor steam dome temperature and Reactor Recirculation Pump 'A' suction temperature is greater than 10 degrees F.
- D.           Differential temperature between reactor steam dome temperature and Reactor Recirculation Pump 'A' suction temperature is less than 50 degrees F.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A#	202001 K4.15	
	Importance Rating	3.1	3.4
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – RPV level &gt; Level 3 is required for a fast speed start (will not prevent a slow speed start).</p> <p>B – FCV actuator must be retracted (12% open) for either a slow or fast speed start.</p> <p>C – Reactor steam dome/pump suction &gt; 10 degrees F is required for a fast speed start (will not prevent a slow speed start).</p>			
Technical Reference(s): SDM-B33		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-B33 Obj E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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REACTOR OPERATOR**

**QUESTION 86**

Given the following conditions:

- The Reactor Water Cleanup System (RWCU) is operating in the normal mode
- The RWCU LD ISOLATION BYPASS Switches (E31-S1A,B) on panels H13-P632 and P642 have been placed in "BYPASS"

Select the expected effect on the RWCU System.

- A. The RWCU System isolation signal on high non-regenerative heat exchanger outlet temperature is defeated.
- B. The RWCU System isolation from high area temperatures ONLY are defeated.
- C. The RWCU System isolation from high differential flow AND high area temperature are defeated.
- D. The RWCU System isolation signal on low RPV level (Level 2) is defeated.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A#	204000 K1.15	
	Importance Rating	3.1	3.2
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – This is a G33 isolation signal, not an E31 isolation signal; therefore, it is not bypassed by the RWCU LD ISOLATION BYPASS Switches.</p> <p>B – This is only 1 of 3 distinct E31 isolation signals.</p> <p>D – This is a B21H isolation signal which can cause the RWCU System to isolate, not an E31 signal</p>			
Technical Reference(s): SDM-E31, SDM-G33		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-E31 Obj E , OT-3036-003-G33 Obj D			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>  446  </u> <u>      </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41 55.43	<u>  X  </u> <u>      </u>	
Comments (Why is it an upper level question): Requires student to predict the response of the RWCU System isolation logic when the Leak Detection System is bypassed.			

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QUESTION 87

RHR Loop A has just been placed into the Shutdown Cooling mode of operation using the normal return path. The cooldown rate is excessive. The Unit Supervisor directs you to reduce the cooldown rate.

Which one of the following is the correct action to reduce the cooldown rate?

- A. Throttle close the RHR A HX'S BYPASS VALVE, E12-F048A, and throttle open the RHR A HX'S OUTLET VALVE, E12-F003A, while maintaining a system flowrate of 7000-7100 gpm.
- B. Throttle open the RHR A HX'S BYPASS VALVE, E12-F048A, and throttle close the RHR A HX'S OUTLET VALVE, E12-F003A, while maintaining a system flowrate of 7000-7100 gpm.
- C. Throttle open the RHR A HX'S BYPASS VALVE, E12-F048A, and throttle close the RHR A HX'S OUTLET VALVE, E12-F003A, while maintaining a system flowrate of 2000-7100 gpm.
- D. Throttle ESW flow through the RHR Heat Exchanger using RHR A HX'S ESW OUTLET VALVE, P45-F068A.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A#	205000 A1.06	
	Importance Rating	3.7	3.7
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – This action will increase the cooldown rate. C – This is the required flowrate band when using the alternate return path via E12-F042A D – Not an approved method to control the cooldown rate per SOI-E12.			
Technical Reference(s): SOI-E12		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination:			
Learning Objective (As available): OT-3036-004-E12 Obj B & D, OT-3046-000-10a Obj B			
Question Source:	Bank #		
	Modified Bank #	<u>  B-73  </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge		
	Comprehension or Analysis	<u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): Requires student to recognize the correct method to be used to reduce the cooldown rate when in the SDC mode of operation.			



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SENIOR REACTOR OPERATOR

QUESTION 88

The plant is operating at 100% reactor power. RHR A HX'S BYPASS VALVE, E12-F048A, has failed in the fully open position.

Which mode(s) of RHR Loop A are/is OPERABLE?

- A.           Suppression Pool Cooling only
- B.           Low Pressure Coolant Injection only
- C.           Containment Spray and Suppression Pool Cooling
- D.           Containment Spray and Low Pressure Coolant Injection

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO		
	Tier #	2	2		
	Group #	2	2		
	K/A#	GEN 2.1.33 / 219000			
	Importance Rating	3.4	4.0		
Proposed Question: See attached					
Proposed Answer: See attached					
<p>Explanation (Why the distractors are incorrect):</p> <p>A – The HXs are required for SP Cooling Operability</p> <p>C - The HXs are required for Containment Spray and SP Cooling Operability</p> <p>D - The HXs are required for Containment Spray</p>					
Technical Reference(s): SDM-E12, Tech Spec 3.5.1, 3.6.1.7, and 3.6.2.3		Reference Attached: <u>  X  </u> (Attach if not previously provided)			
Proposed references to be provided to applicants during examination: None					
Learning Objective (As available): OT-3036-004-E12 Obj B & N, OT-3037-000-09 Obj A & B, OT-3037-001-10 Obj A & B					
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)		
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>			
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>          </u>			
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>				
Comments (Why is it an upper level question): N/A					

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QUESTION 89

Plant conditions are as follows:

- Core offload is in progress
- Refuel Bridge is stationed in the 'cattle chute' (Portable Refueling Shield) between the Reactor Pressure Vessel and the Dryer Storage Pool
- Refuel Bridge grapple is loaded with a new fuel bundle
- Reactor Mode Switch is in the SHUTDOWN position
- All control rods are fully inserted

Which one of the following describes the allowable direction(s) that the Refuel Bridge can travel in (i.e., travel direction will not be prevented by an interlock)?

- A. The Refuel Bridge can move in either direction.
- B. The Refuel Bridge can move towards the Dryer Storage Pool only.
- C. The Refuel Bridge can move towards the Reactor Pressure Vessel only.
- D. The Refuel Bridge cannot move in either direction

ANSWER: B

**Examination Outline Cross-Reference**

Level:	RO	SRO
Tier #	2	2
Group #	3	2
K/A#	234000 A3.02	
Importance Rating	3.1	3.7

Proposed Question: See attached

Proposed Answer: See attached

Explanation (Why the distractors are incorrect):

A / C / D – The Bridge Rev Stop 2 interlock will prevent reverse travel of the Refuel bridge towards the RPV if the Reactor Mode Switch is not in REFUEL. Forward travel in the direction of the Dryer Storage Pool is allowed.

Technical Reference(s): SDM-F11/15

Reference Attached:   X  

(Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): SYS-5014-003-F11/F15 Obj E

Question Source:

Bank #

Modified Bank #

New

        
        
  X  

(Note changes or attach parent)

Question History:

Previous NRC Exam

Previous Quiz / Test

Question Cognitive Level:

Memory or Fundamental Knowledge

Comprehension or Analysis

  X  (C)  

10 CFR Part 55 Content:

55.41   X  

55.43       

Comments (Why is it an upper level question): Requires student to analyze plant conditions in order to predict which directions the Refuel Bridge is allowed to travel in.

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**QUESTION 90**

A plant transient resulted in a loss of extraction steam to FDW Heaters 5A and 5B. The Immediate Actions of ONI-N36, Loss of Feedwater Heating, have been completed. All remaining FDW Heaters are in operation. Current reactor power is 90%.

What is the Main Generator MWe limitation based on the current FDW Heater lineup?

The Main Generator Mwe Limitation Table from ONI-N36 is provided below for reference.

Heater	Number of Trains Lost	Side of Heater Lost	RFP Steam Supply		Basis
			Main	Extraction	
1 & 2	1	Condensate	1125 MWe	1188 MWe	1
5	2	Extraction	938 MWe	1000 Mwe	2
1 & 2, 3, 5, 6	2 Trains of the same heater	Condensate	563 MWe	625 MWe	3

- A. 625 MWe
- B. 938 MWe
- C. 1000 MWe
- D. 1188 MWe

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A#	245000 A2.06	
	Importance Rating	2.9	3.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – This would be the Generator Mwe limitation if the 'condensate' side of FDW Heaters 5A and 5B was lost.</p> <p>B - This would be the Generator Mwe limitation if the RFPs were operating on 'Main Steam'.</p> <p>D - This would be the Generator Mwe limitation if the 'condensate' side of FDW Heater 1A(B/C) and 2A(B/C) was lost.</p>			
Technical Reference(s): ONI-N36		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-000-N36/25/26 Obj F, OT-3035-004-04b Obj A			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  </u> (A)	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): Requires student, using a reference table and current plant conditions, to determine the current Main Generator MWe limitation.			

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**QUESTION 91**

The plant is operating at 90% reactor power with both Reactor Feed Pump Turbines (RFPTs) in operation. RFPT 'A' Flow Controller is in MANUAL and RFPT 'B' Flow Controller is in AUTOMATIC. The STARUP FDW PUMP SELECT SWITCH is in the MFP position.

Which one of the following describes the response of the Feedwater System if the speed of RFPT 'A' is slowly decreased?

- A. RFPT 'B' flow rate will increase, RFPT 'A' flowrate will decrease, and total feedwater flow will remain the same.
- B. RFPT 'B' discharge pressure will slightly decrease, RFPT 'A' discharge pressure will slightly increase, and total feedwater flow will remain the same.
- C. RFPT 'B' flow rate will remain the same, RFPT 'A' flowrate will decrease, and total feedwater flow will decrease.
- D. RFPT 'B' discharge pressure will slightly increase, RFPT 'A' discharge pressure will slightly decrease, and total feedwater flow will increase.

**ANSWER: A**

	Level:	RO	SRO
	Tier #	2	2
	Group #	1	2
	K/A#	259001 A4.02	
	Importance Rating	3.9	3.7
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>Pump Laws: Flow is proportional to Speed. Increase RFPT speed, then pump flow increases (and pump discharge pressure will also slightly increase)</p> <p>B – RFPT B discharge pressure will increase and RFPT A discharge pressure will decrease.</p> <p>C – RFPT B flow will increase; total fdw flow will remain the same because RFPT A flow decreases.</p> <p>D – Total fdw flow remains the same</p>			
Technical Reference(s): SDM-C34, GP Components Text Chapter 2		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-C34 Obj B & C, OT-3303-003-02 Obj 11, 12, and 13			
Question Source:	Bank #		
	Modified Bank #	<u>  812  </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>  99-006  </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>	
	Comprehension or Analysis	<u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): Requires student to predict the response of the Feedwater System and FWLC System based initial plant conditions.			



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**QUESTION 92**

The plant is operating at 100% reactor power when Division 1 DC Bus ED-1-A is lost.

Which one of the following conditions will occur?

- A. RCIC automatically initiates.
- B. Recirculation Pumps 'A' and 'B' trip off.
- C. Division 1 Diesel Generator automatically trips, if running.
- D. Alarm window "ANN PWR SUPPLY FAIL" on H13-P680 energizes.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A#	263000 K3.03	
	Importance Rating	3.4	3.8
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – RCIC will be inoperable and will not initiate. C – DC control power is lost, all automatic trips except overspeed are disabled. D – DC Bus D-1-A provide Control Room annunciator power, therefore, this alarm will not occur.			
Technical Reference(s): SDM-R42, ONI-R42-1		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-R42 Obj B & E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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**QUESTION 93**

The plant is in a refueling outage and the M14 Containment Vessel and Drywell Purge System (CVDWP) is operating in the Refuel mode. Containment Ventilation Exhaust Radiation Monitor D17-K609C is in alarm due to a Downscale indication. All remaining Containment Ventilation Exhaust Radiation Monitor indications are normal for current plant conditions.

An I&C Technician is troubleshooting D17-K609C when the following alarms are received in the Control Room:

- CNTMT & DW PURGE EXHAUST FAN A FLOW LOW
- CNTMT & DW PURGE EXHAUST FAN B FLOW LOW
- CNTMT PURGE SUPPLY FAN A FLOW LOW
- CNTMT PURGE SUPPLY FAN B FLOW LOW
- DW PURGE SUPPLY FAN A FLOW LOW
- DW PURGE SUPPLY FAN B FLOW LOW

Which one of the following conditions is the cause for the current status of the CVDWP System?

- A. The I&C Technician placed the MODE SWITCH for D17-K609A to the TRIP TEST position.
- B. The I&C Technician placed the MODE SWITCH for D17-K609B to the ZERO position.
- C. The I&C Technician placed the MODE SWITCH for D17-K609D to the ZERO position.
- D. Either D17-K609A or D17-K609D is in an UPSCALE TRIP (HI-HI) condition.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A#	272000 K4.02	
	Importance Rating	3.7	4.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>CVDWP isolation dampers isolation logic is an 'inbd-outbd' logic (either A and D or B and C)</p> <p>A – Channels A and C do not satisfy the isolation logic.</p> <p>C – Channels C and D do not satisfy the isolation logic.</p> <p>D – Channels A and C or Channels C and D do not satisfy the isolation logic.</p>			
Technical Reference(s): SDM-M14, SDM-D17A		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-M14 Obj F, OT-3036-004-D17A Obj D			
Question Source:	Bank # <u>          </u> Modified Bank # <u>          </u> New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam <u>          </u> Previous Quiz / Test <u>          </u>		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>          </u> Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): Requires student to analyze current plant conditions, and in conjunction with knowledge of Cont Vent Exhaust Rad Monitor logic and CVDWP isolation damper logic, determine the reason for the response current state of the CVDWP System.			

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QUESTION 94

During normal plant operations, one train of the Control Room HVAC and Emergency Recirculation System (M25/26) is operating in the NORMAL mode and the other train is in Standby. An inadvertent high radiation initiation signal is received.

Which one of the following describes the response of the Control Room HVAC and Emergency Recirculation System?

- A. The operating train will shutdown and the standby train will start in the EMERGENCY RECIRCULATION mode.
- B. The standby train will start in the EMERGENCY RECIRCULATION mode only if the operating train fails to shift to the EMERGENCY RECIRCULATION mode within 30 seconds.
- C. The operating train continues to operate in the NORMAL mode and the standby train will start in the EMERGENCY RECIRCULATION mode.
- D. The operating train will shift to the EMERGENCY RECIRCULATION mode and the standby train will start in the EMERGENCY RECIRCULATION mode.

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A#	290003 A4.03	
	Importance Rating	2.8	2.8
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – The operating train will shift to the ER mode, it will not shutdown.</p> <p>B – There is no time delay for the standby train to start in the ER mode based upon the failure of the operating train to not shift to the ER mode.</p> <p>C – The operating train will shift to the ER mode, it will stay in the Normal mode.</p>			
Technical Reference(s): SDM-M25/26		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-M25/26 Obj E			
Question Source:	Bank #	<u>  1115  </u>	(Note changes or attach parent)
	Modified Bank #	<u>          </u>	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): N/A			

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**QUESTION 95**

The plant is operating at 75% reactor power.

MSL B INBD MSIV B21-F022B control switch is in the TEST position. The Control Room Operator depresses the MSL B INBD MSIV TEST pushbutton 1B21H-S3B.

Which one of the following describes the response of MSL B INBD MSIV B21-F022B?

- A. Instrument Air bleeds off the bottom portion of the MSIV air cylinder and the top portion of the MSIV air cylinder is pressurized to stroke the MSIV closed in 3-5 seconds.
- B. Safety-Related Instrument Air bleeds off the bottom portion of the MSIV air cylinder and the top portion of the MSIV air cylinder is pressurized to stroke the MSIV closed in 3-5 seconds.
- C. Safety-Related Instrument Air bleeds off the bottom portion of the MSIV air cylinder causing the MSIV to slowly close.
- D. Instrument Air bleeds off the bottom portion of the MSIV air cylinder causing the MSIV to slowly close.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A#	300000 K1.05	
	Importance Rating	3.1	3.2
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – This answer describes the normal closing operation of the MSIV, not the slow closure test operation.</p> <p>B/C – Safety-Related Inst Air is not the source of operating air to the MSIVs.</p>			
Technical Reference(s): SDM-B21/N11		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-B21/N11 Obj E, OT-3046-000-10b Obj B			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  (C)  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to recognize the source of air to the MSIVs and the operation of the MSIV during MSIV closure testing.			



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**QUESTION 96**

Which one of the following would be the control rod movement sequence most likely to cause the phenomenon known as the 'reverse power effect'?

- A. 1 or 2 notch withdrawal of a deep control rod.
- B. 1 or 2 notch withdrawal of a shallow control rod.
- C. 1 or 2 notch insertion of a shallow control rod.
- D. 10 or 12 notch continuous withdrawal of a shallow control rod.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	3
	K/A#	201003 K5.05	
	Importance Rating	3.0	3.1
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – small withdrawal movement of shallow rods, not deep rods, causes reverse power effect.</p> <p>C - small withdrawal movement of shallow rods, not insertion, causes reverse power effect.</p> <p>D – reverse power effect is not observed during continuous rod withdrawal.</p>			
Technical Reference(s): GP Reactor Theory Text, Chapter 5		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3301-003-05 Obj 12			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 97**

During refueling operations, a FPCC SURGE TANK A LEVEL HI/LO annunciator is received. The Control Room Operator reports that surge tank level is high. The FPCC SURGE TK FILL FROM CST VALVE, G41-F045, is verified closed.

Which one of the following could be the cause of the surge tank high level?

- A. Removal of the Steam Dryer from the Dryer Storage Pool during RPV re-assembly.
- B. Emergency makeup valve from the Service Water System (P41) is open or leaking by.
- C. Fuel Transfer Tube Drain Tank is pumping down during fuel transfer operations.
- D. FPCC flow to the lower fuel pools was raised due to the increased heat load from spent fuel bundles removed from the reactor.

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	3
	K/A#	233000 A2.03	
	Importance Rating	2.8	3.0
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Removal of the Steam Dryer would cause pool level to decrease, thereby causing surge tank level to decrease as the water in the surge tanks is required to makeup for the displaced volume of the Steam Dryer.</p> <p>B – Emergency makeup is from ESW, not SW (no such SW valve exists).</p> <p>D- Shifting FPCC flows should have no effect on FPCC System volume, therefore, no effect on surge tank level.</p>			
Technical Reference(s): SDM-G41, ARI-H13-P970-1 (D3)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-G41 Obj B & C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze each condition in order to determine the effect on FPCC surge tank level.			

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SENIOR REACTOR OPERATOR**

**QUESTION 98**

Which one of the following load sets will be lost if Bus H11 becomes de-energized?

- A. Hotwell Pump A, Hotwell Pump C, and Condensate Booster Pump A
- B. Hotwell Pump B and Condensate Booster Pump B
- C. Hotwell Pump A, Condensate Booster Pump A, and Condensate Booster Pump C
- D. Hotwell Pump C, Condensate Booster Pump A, and Condensate Booster Pump C

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	2	3
	K/A#	256001 K2.01	
	Importance Rating	2.7	2.8
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Hotwell Pump C is powered from H12. B – Hotwell Pump B and CBP B are both powered from H12. D - Hotwell Pump C is powered from H12.			
Technical Reference(s): SDM-N21/61		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-N21/N61 Obj C			
Question Source:	Bank #	<u>  1112  </u>	
	Modified Bank #	<u>          </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): N/A			

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 99**

Which one of the following core components acts as a partition to force the majority of coolant and moderator flow into the control rod guide tubes, fuel support pieces, and to the fuel assemblies?

- A. Baffle plate
- B. Core shroud
- C. Core plate
- D. Control rod guide tube flow orifices

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A#	290002 K4.02	
	Importance Rating	3.1	3.2
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Supports the jet pumps and separates recirc suction from jet pump discharge.</p> <p>B – Divides the upward core flow from the downward annular flow.</p> <p>D – Control rod guide tubes do not have flow orifices.</p>			
Technical Reference(s): SDM-B13		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-B13 Obj C& D			
Question Source:	Bank # Modified Bank # New	<u>          </u> <u>          </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>          </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>          </u>		
Comments (Why is it an upper level question): N/A			



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REACTOR OPERATOR

QUESTION 100

How long is the Division 1 battery designed to supply the required Loss of Coolant Accident (LOCA) loads without allowing the final discharge voltage to decrease below the minimum design cell voltage?

The Division 1 battery will supply the LOCA loads (with coincident AC power loss) for a MINIMUM of \_\_\_\_\_.

**NOTE: Selection of duration greater than the minimum design will be an INCORRECT response.**

- A. 2 hours
- B. 3 hours
- C. 4 hours
- D. 12 hours

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295004 A2.03	
	Importance Rating	2.8	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B- 3 hours is the timeframe to perform DC load shedding iaw ONI-R10.</p> <p>C – There is no basis for 4 hours.</p> <p>C – 12 hours is the time for a battery charger to restore the battery from design minimum discharge state to a fully charged state.</p>			
Technical Reference(s): SDM-R42, TS LCO 3.8.4 Bases		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-R42 Obj B, OT-3037-001-12 Obj B			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

**U.S. NUCLEAR REGULATORY COMMISSION  
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REACTOR OPERATOR**

QUESTION 101

A tagging error resulted in the de-energization of 120 VAC Instrument Panel EB-1-A1. The Control Room Operator reports that the SLC A OUT OF SERVICE alarm has annunciated.

If an ATWS occurs that requires boron injection, how would the Standby Liquid Control 'A' subsystem respond when the Control Room Operator places the SLC PUMP A control switch to ON?

- A. Squib Valve 'A' will not fire and SLC Pump 'A' will not start.
- B. Squib Valve 'A' will not fire but SLC Pump 'A' will start.
- C. Squib Valve 'A' will fire but SLC Pump 'A' will not start.
- D. Squib Valve 'A' will fire and SLC Pump 'A' will start.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	211000 K2.02	
	Importance Rating	3.1	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – SLC Pump A will start.</p> <p>C / D – Squib Valve A will not fire because electrical power is lost to the firing circuit from EB-1-A1.</p>			
Technical Reference(s): SDM-C41, ARI-H13-P601-19(D1), ONI-R25-1, PDB-H022		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-C41 Obj C & D, OT-3036-002-R14/15 Obj I			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to predict the response of SLC System A if the system were initiated with a loss of 120V Instrument Panel EB-1-A1.			

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REACTOR OPERATOR

QUESTION 102

The reactor is critical and plant heatup/pressurization is in progress when the detector voltage for IRM Channel 'D' decreases to 50% of the normal detector voltage. All other IRMs are OPERABLE.

Which one of the following describes the response of IRM Channel 'D'?

- A. A control rod block and RPS half scram signal are generated.
- B. Only a control rod block signal is generated.
- C. Only a RPS half scram signal is generated.
- D. A control rod block and RPS half scram signal are not generated.

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	215003 K3.03	
	Importance Rating	3.7	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B – A RPS half scram signal is also generated. C – A control rod block signal is also generated D – A control rod block and RPS half scram signal are generated.			
Technical Reference(s): SDM-C51(IRM)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-C51(IRM) Obj B & D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to predict the response (output) from the IRM channel due to a failure of the detector voltage during a plant startup.			

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**QUESTION 103**

The plant is operating at 100% reactor power when a loss of 4160V Bus EH11 occurs. Subsequently, a reactor scram occurs. The Control Room Operator notes that the Rod Control & Information System (RC&IS) indication is blinking ON and OFF on the full core display.

Which one of the following action(s) can the Control Room Operator perform to verify ALL RODS IN using the RC&IS display?

- A. Depress the DATA SOURCE pushbutton to select the operable RC&IS channel.
- B. Depress the RAW DATA and SCRAM VALVES pushbuttons to determine control rod positions.
- C. Depress the ACKN ACCUM FAULT pushbutton to allow the control rods to settle into the full-in position.
- D. Release the DATA MODE pushbutton and select the operable RC&IS channel with the DATA SOURCE pushbutton.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	201005 A4.01	
	Importance Rating	3.7	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Data Source PB is functional only when Data Mode is not depressed.</p> <p><del>B) C</del> – Scram Valves PB has no effect on rod position indication.</p> <p>C – Acknowledge Accumulator Fault PB has no effect on rod position indication.</p>			
Technical Reference(s): SDM-C11(RCIS), SOI-C11(RCIS)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-C11(RCIS) Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			



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**QUESTION 104**

Which one of the following describes the interlock associated with the RCIC pump suction valves?

- A. The suction source will automatically swap from the Suppression Pool to the CST upon a low level in the Suppression Pool.
- B. The suction source will automatically swap from the Suppression Pool to the CST upon a high level in the Suppression Pool.
- C. The suction source will automatically swap from the CST to the Suppression Pool upon a low level in the Suppression Pool.
- D. The suction source will automatically swap from the CST to the Suppression Pool upon a low level in the CST.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	217000 K1.03	
	Importance Rating	3.6	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / B – The suction valves do not automatically shift from the SP to the CST.</p> <p>C – The suction valves do not automatically shift on low level in the SP, it is a high level in the SP.</p>			
Technical Reference(s): SDM-E51		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-E51 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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REACTOR OPERATOR**

QUESTION 105

The plant has undergone a transient that resulted in a Recirculation Flow Control valve runback.

Which one of the following describes the allowable operation of the Recirculation Flow Control Valves, prior to resetting the runback?

The Recirculation Flow Control valves can \_\_\_\_\_.

- A. be closed using LOOP manual operation, however, they can only be opened to the 12% valve position.
- B. be closed using LOOP manual operation, however, they can only be opened to the position that they ran back to.
- C. not be closed any further because they are at the full closed stop and cannot be re-opened due to a hydraulic lock on the valves.
- D. not be closed any further because they are at the full closed stop, however, they can be opened to the 22% valve position.

ANSWER: B
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<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	202002 K2-12 K1, 12	
	Importance Rating	3.7	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – FCV runback is to the 17% valve position, therefore they could be closed and then re-opened to the 17% position.</p> <p>C/D – FCVs can be closed further than the 17% runback position.</p>			
Technical Reference(s): SDM-B33		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-B33 Obj E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to comprehend the FCV circuitry operation with a FCV runback in effect.			

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**QUESTION 106**

The plant has scrammed due to a loss of off-site power. HPCS and RCIC did not start. When RPV water level reached Level 1, the Control Room Operator reports that the ADS 105-second time delay logic timer is running.

The Unit Supervisor directs the Control Room Operator to inhibit ADS per PEI-B13, RPV Control (Non-ATWS).

Later the Control Room Operator is directed to arm and depress both Manual Initiation pushbuttons for the ADS 'A' subsystem.

Which one of the following is the response of the ADS 'A' subsystem in this situation?

ADS 'A' subsystem will initiate \_\_\_\_\_.

- A. immediately, if any Division 1 low pressure ECCS subsystem pressure permissive is satisfied.
- B. in 105 seconds, if any Division 1 low pressure ECCS subsystem pressure permissive is satisfied.
- C. immediately, regardless of the Division 1 low pressure ECCS subsystem status.
- D. in 105 seconds, regardless of the Division 1 low pressure ECCS subsystem status.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	1	
	K/A#	218000 K4.02	
	Importance Rating	3.8	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B / D – the RPV level and 105 second timer requirements are bypassed by the Manual Initiation PBs.</p> <p>C – A Division 2 low pressure ECCS pump must be running.</p>			
Technical Reference(s): SDM-B21C		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-B21C Obj E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  (C)  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to analyze given plant conditions to determine the response of the ADS System if the manual Initiation PBs are armed and depressed.			

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QUESTION 107

Which one of the following steam loads is supplied steam from the pressure/flow equalizer manifold upstream of the Main Turbine Stop and Control Valves?

- A. Extraction Steam Hot Water Heat Exchanger
- B. Reactor Feed Pump Turbines
- C. Reactor Core Isolation Cooling (RCIC) Turbine
- D. Main Turbine Sealing Steam

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	239001 K1.22	
	Importance Rating	3.1	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Steam supplied from 9th stage extraction steam. C – Steam supplied from MSL A between the RPV and Inbd MSIV A. D – Steam supplied from Steam Seal Evaporator.			
Technical Reference(s): SDM-B21/N11		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-B21/N11 Obj B			
Question Source:	Bank # Modified Bank # New	<u>  1116  </u> _____ _____	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	_____ <u>  99-002  </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> _____	
10 CFR Part 55 Content:	55.41 55.43	<u>  X  </u> _____	
Comments (Why is it an upper level question): N/A			



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QUESTION 108

Which one of the following describes the operation of the Static Transfer Switch associated with the ATWS UPS Inverter?

- A. The Static Transfer Switch will shift to the alternate (AC) source on an over-current condition and will automatically shift back to the Inverter when the inverter fault has cleared.
- B. The Static Transfer Switch will shift to the alternate (AC) source on an over-voltage condition and will automatically shift back to the Inverter when the inverter fault has cleared.
- C. The Static Transfer Switch will shift to the alternate (AC) source on an over-current condition and will not automatically shift back to the Inverter when the inverter fault has cleared.
- D. The Static Transfer Switch will shift to the alternate (AC) source on an under-voltage condition and will not automatically shift back to the Inverter when the inverter fault has cleared.

ANSWER: A

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	262002 K6.03	
	Importance Rating	2.7	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): B – The STS will not switch on an over-voltage condition. C / D – The STS will automatically switch back to the Inverter when the fault has cleared.			
Technical Reference(s): SDM-R14/R15		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-R14/15 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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**QUESTION 109**

A Precaution and Limitation in SOI-N64/62, Off-Gas/Condenser Air Removal System, states, "In the event of a loss of dilution steam from SJAE's, initiate an air purge through the operating preheater/recombiner side for at least one hour".

Which one of the following statements is the bases for this Precaution and Limitation?

- A. To prevent damage to the Holdup Line loop seal level indicators due to a rapid change in pressure.
- B. To prevent a hydrogen explosion hazard internal to the system.
- C. To maintain the recombiner inlet temperature below 300 degrees F.
- D. To prevent reverse flow through the recombiners that could result in the introduction of catalyst pellets, fines, or particles into the upstream portion of the system.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	271000 K6.08	
	Importance Rating	2.9	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – This bases pertains to the Precaution which deals with opening the loop seal fill valves.</p> <p>C – This is a Precaution which avoids a hydrogen explosion hazard.</p> <p>D – An air purge does prevent reverse air flow but it is not the bases for this Precaution.</p>			
Technical Reference(s): SOI-N64/62		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-N62 Obj F			
Question Source:	Bank #	<u>  304  </u>	(Note changes or attach parent)
	Modified Bank #	<u>          </u>	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>  99-006  </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): N/A			

**U.S. NUCLEAR REGULATORY COMMISSION  
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REACTOR OPERATOR**

**QUESTION 110**

Control Room HVAC Train 'A' (M25/26) is operating in the Emergency Recirculation mode. A Non-Licensed Operator reports smoke coming from the 'A' Emergency Recirculation Charcoal Filter Plenum and the plenum is glowing red.

Which one of the following describes the method to combat a fire in the 'A' Emergency Recirculation Charcoal Filter Plenum?

- A. The Fire Protection System will automatically initiate the charcoal filter deluge system and fill the charcoal filter plenum with water.
- B. The Fire Protection System will automatically initiate the charcoal filter preaction system and fill the charcoal filter plenum with water.
- C. The Control Room Operator arms and depresses CONT RM EMG RCIRC A CHAR FLTR DELUGE pushbutton (P54-F3180) to manually initiate the charcoal filter deluge system and fill the charcoal filter plenum with water.
- D. The Fire Protection System is manually valved into the deluge system locally, and then the deluge system manual initiation valve is opened locally to fill the charcoal filter plenum with water.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	286000 A3.04	
	Importance Rating	3.2	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / B – The deluge system for charcoal filter plenums has no automatic initiation feature.</p> <p>C – Use of the Control Room deluge switch is administratively disallowed. Also, the local deluge system supply isolation valve is closed locally.</p>			
Technical Reference(s): SDM-P54(WTR), SOI-P54(WTR)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-P54(WTR) Obj C & E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to determine which type of P54(WTR) component is used for charcoal filter plenums and how it can be properly initiated.			

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REACTOR OPERATOR**

**QUESTION 111**

The plant was operating at 45% reactor power when a transient on the First Energy grid caused a fast closure of the Turbine Control Valves for the Perry Main Turbine. The Feedwater Level Control System maintained reactor water level within 10 inches of normal level. Reactor pressure increased slightly but was maintained by the Turbine Bypass Valves.

Which one of the following describes the current plant conditions for this event?

- A. The reactor scrammed and the Reactor Recirculation Pumps tripped off.
- B. The reactor scrammed and the Reactor Recirculation Pumps downshifted to slow speed.
- C. The reactor remained at power with a reduced power due to a Reactor Recirculation flow control valve runback.
- D. The reactor remained at power with a reduced power due to a Reactor Recirculation Pump downshift to slow speed.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	202001 K5.05	
	Importance Rating	3.5	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – The RR Pumps downshift to slow, they do not trip off.</p> <p>C / D – The reactor scrammed because reactor power was greater than 40% (EOC-RPT was not bypassed).</p>			
Technical Reference(s): SDM-C71, SDM-B33		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-006-B33 Obj E, OT-3036-005-C71 Obj F			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires the student to analyze the initial conditions in order to predict the plant response.			



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REACTOR OPERATOR**

**QUESTION 112**

A HIGH alarm is received on the Gaseous channel of the Drywell Atmosphere Airborne Radiation Monitor, D17-K670.

Which one of the following conditions will occur?

- A. The Containment Evacuation Alarm will activate.
- B. The Plant Emergency Alarm will activate.
- C. The COMB GAS DW PURGE INBD (M51-F090) and COMB GAS DW PURGE OTBD (M51-F110) valves will isolate (if they are open).
- D. The DW PURGE SUPP TRN A FIRST ISOL DAMPER (M14-F055A) and DW PURGE SUPP TRN A SECOND ISOL DAMPER (M14-F055B) will isolate (if they are open).

**ANSWER: C**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	2	
	Group #	2	
	K/A#	288000 K1.05	
	Importance Rating	3.3	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – The Containment Atmosphere ABRM (K680) will activate the Containment Evacuation alarm.</p> <p>B – ABRM do not activate the Plant Emergency alarm.</p> <p>D – The Containment Ventilation Exhaust PRM will cause the M14 dampers to isolate</p>			
Technical Reference(s): SDM-D17)ABRM), SDM-M51		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-005-M51 Obj B, OT-3036-D17 Obj F			
Question Source:	Bank #	<u>  647  </u>	
	Modified Bank #	<u>          </u> (Note changes or attach parent)	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>  99-006  </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>  X  </u>	
	Comprehension or Analysis	<u>          </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): N/A			

**U.S. NUCLEAR REGULATORY COMMISSION  
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REACTOR OPERATOR**

**QUESTION 113**

Hydrogen Igniters are designed to \_\_\_\_\_.

- A. burn hydrogen while it is at low concentrations and therefore limit the threat to containment integrity caused by low internal pressure.
- B. burn hydrogen while it is at low concentrations and therefore limit the threat to containment integrity caused by high internal pressure.
- C. cause a hydrogen deflagration in order to minimize the threat to containment integrity caused by high temperature.
- D. cause a hydrogen deflagration in order to minimize the threat to containment integrity due to vacuum breaker failure.

**ANSWER:B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	1	
	K/A#	500000 EK1.01	
	Importance Rating	3.3	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A - The risk to containment is due to high internal (not low) pressure C / D The igniters are for a controlled burn, not a deflagration			
Technical Reference(s): SDM-M56, PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-006-10 Obj C, OT-3036-004-M56 Obj B			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>  X  </u> <u>      </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>      </u>		
Comments (Why is it an upper level question): N/A			

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REACTOR OPERATOR

QUESTION 114

Which one of the following inclusive combinations of mode switch position, average reactor coolant temperature, and reactor vessel head closure bolt tensioning defines the MODE known as 'Cold Shutdown'?

- A. The mode switch is in REFUEL, average reactor coolant temperature is 198 °F, and all reactor vessel head closure bolts are fully tensioned.
- B. The mode switch is in SHUTDOWN, average reactor coolant temperature is 198 °F, and all reactor vessel head closure bolts are fully tensioned.
- C. The mode switch is in SHUTDOWN, average reactor coolant temperature is 198 °F, and some reactor vessel head closure bolts are not fully tensioned.
- D. The mode switch is in SHUTDOWN, average reactor coolant temperature is 208 °F, and all reactor vessel head closure bolts are fully tensioned.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 1	
	K/A#	GEN 2.1.22	
	Importance Rating	2.8	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Mode switch cannot be in REFUEL. C – All reactor vessel head closure bolts must be fully tensioned (this is definition of Refuel). D – Temperature must be $\leq 200$ degrees (this is definition of Hot Shutdown).			
Technical Reference(s): Tech Specs		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-005-02 Obj A			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

**U.S. NUCLEAR REGULATORY COMMISSION  
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REACTOR OPERATOR**

**QUESTION 115**

You are the Licensed Operator 'At the Controls'. You have requested to be temporarily relieved by another licensed operator for a short break. Since assuming the shift, the following items have started, are in progress, or have been completed:

1. The Operations Manager took a ½ PA Day to play golf.
2. Surveillance testing of APRM 'D' is in progress by I&C.
3. Reactor power was decreased 5% due to System Dispatcher request.
4. The ROD DRIFT annunciator is alarming spuriously and I&C has been notified.
5. Preparations for Division 1 Diesel Generator monthly surveillance testing may start next shift.

Which of the above item(s) are **REQUIRED** to be discussed with the other licensed operator before you can be temporarily relieved?

**The correct answer must list all REQUIRED items; a partial list will be incorrect.**

- A. 2 and 3
- B. 2, 3, and 4
- C. 2, 3, 4, and 5
- D. 1, 2, 3, 4, and 5

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 1	
	K/A#	GEN 2.1.2	
	Importance Rating	3.0	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Does not contain all required items (Rod drift alarm must be discussed also). C – Div 1 DG preps which may start is not required to be discussed D - OPS Manager and Div 1 DG preps which may start is not required to be discussed			
Technical Reference(s): PAP-0126		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-008-03 Obj A			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (C) <u>  </u>		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): Requires student to evaluate each item against the list of items in the admin procedure required to be discussed before a temporary relief may occur			



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REACTOR OPERATOR**

QUESTION 116

A surveillance test that will cause the system to become inoperable is scheduled to be performed. Unless otherwise noted in the surveillance test, the system is considered to be inoperable when the \_\_\_\_\_.

- A. the Supervising Operator signs the "Authorization to Start The Test" block on the Data Package Cover Sheet.
- B. the Unit Supervisor signs the "Authorization to Start the Prerequisites" block on the Data Package Cover Sheet.
- C. the Lead Test Performer annotates the start date/time in the Test Tracking Log.
- D. the first surveillance step is actually performed which will make the system inoperable, such as installing a jumper or turning a switch.

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 2	
	K/A#	GEN 2.2.12	
	Importance Rating	3.0	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A / C / D – The system is considered to be inoperable when the Control Room Unit Supervisor gives permission to start the Pre-req's.</p>			
Technical Reference(s): PAP-1105		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-008-03 Obj A			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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**QUESTION 117**

In accordance with IOI-9, Refueling, which one of the following statements best describes the reason that personnel performing Core Alterations shall maintain direct communications with the Control Room?

- A. Core Alterations are considered to be a change in core reactivity that requires the knowledge and consent of the Operator at the Controls.
- B. Core Alterations are considered to be a special infrequently performed tests or evolutions (IPTEs) that require constant communication with the Control Room.
- C. To allow the Operator at the Controls to monitor for inadvertent criticality and inform the Refuel Floor of such event.
- D. To allow the on-shift Shift Technical Advisor (STA) to perform a shutdown margin check required during Core Alterations.

**ANSWER: C**

**Examination Outline Cross-Reference**

Level:	RO	SRO
Tier #	3	
Group #	Cat 2	
K/A#	GEN 2.2.26	
Importance Rating	2.5	

Proposed Question: See attached

Proposed Answer: See attached

Explanation (Why the distractors are incorrect):

A – SRO authorizes the performance of Core Alts, not the Operator at the Controls.

B – Core Alts are not defined as 'IPTEs'.

D – SDM check is not a Core Alt.

Technical Reference(s): IOI-9, ORM 6.2.3, SOI-F11, SOI-F15, PAP-0802

Reference Attached:   X  

(Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OT-3037-000-16 Obj E, OT-3039-007-01 Obj C, SYS-5014-003-F11/15 Obj N

Question Source:

Bank #

Modified Bank #

New

  X  

(Note changes or attach parent)

Question History:

Previous NRC Exam

Previous Quiz / Test

Question Cognitive Level:

Memory or Fundamental Knowledge

Comprehension or Analysis

  X  

10 CFR Part 55 Content:

55.41

55.43

  X  

Comments (Why is it an upper level question): N/A

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QUESTION 118

Given the following plant conditions:

- Reactor power is 50%
- All Turbine Bypass valves fail open
- The MSIVs fail to automatically close
- The MSIVs are manually closed

Prior to MSIV closure, which one of the following combinations of reactor power and reactor pressure would indicate that a Safety Limit violation had occurred?

	<u>Reactor Power</u>	<u>Reactor Pressure</u>
A.	35%	810 psig
B.	30%	775 psig
C.	20%	770 psig
D.	10%	750 psig

ANSWER: B

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 2	
	K/A#	GEN 2.2.22	
	Importance Rating	3.4	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A / C / D – The Safety Limit is exceeded if reactor power is greater than 23.8% and reactor pressure is less than 785 psig. The Safety Limit for each distractor is met.			
Technical Reference(s): Tech Specs-Safety Limits		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3037-007-03 Obj A & C			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

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QUESTION 119

Plant startup is in progress at 5% reactor power.

Which one of the following describes the allowable mode of operation and bases for operation of the Containment Vessel and Drywell Purge System (M14)?

- A. Refuel mode in order to reduce airborne activity in Containment during RCIC operation.
- B. Single Train Drywell Ventilation mode in order to reduce Drywell average air temperature due to steam leaks.
- C. Intermittent mode during backwash of RWCU Filter Demineralizer 'A' in order to minimize off-site radiation doses.
- D. Intermittent mode during the time that RWCU Filter Demineralizer 'A' is in Hold due to leaks in the RWCU F/D System.

ANSWER: D

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 3	
	K/A#	GEN 2.3.9	
	Importance Rating	2.5	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – Refuel mode operation not allowed in Modes 1, 2, and 3. B – Single Drywell Train Ventilation mode operation not allowed in Modes 1, 2, and 3. C – CVDWP should not be run during G36 FD backwashing in order to minimize off-site dose			
Technical Reference(s): SOI-M14, SOI-G33		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-003-M14 Obj D, D, G, and I			
Question Source:	Bank # _____	(Note changes or attach parent)	
	Modified Bank # _____		
	New <u>  X  </u>		
Question History:	Previous NRC Exam _____		
	Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u>		
	Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u>		
	55.43 _____		
Comments (Why is it an upper level question): N/A			



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**QUESTION 120**

Jim Noname, age 37, is a radiation worker at Perry. He has no exposure from any other nuclear facility. Jim's current year-to-date (YTD) radiation exposure (TEDE) is 500 millirem and his lifetime radiation exposure is 15 Rem.

How much more radiation exposure can Jim receive this year before an Increased Dose Control Level Authorization is required?

- A. 500 millirem
- B. 1500 millirem
- C. 3500 millirem
- D. 4500 millirem

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 3	
	K/A#	GEN 2.3.1	
	Importance Rating	2.6	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B / C / D – the initial Dose Control Level (DCL) is 1000mrem. The total doses in each distractor exceed this initial DCL and therefore, would not be the first instance when an Increased Dose Control Level would need to be authorized.</p>			
Technical Reference(s): HPI-B0003		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3039-007-01 Obj A, B, and C			
Question Source:	Bank #		
	Modified Bank #	<u>  405  </u>	(Note changes or attach parent)
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>	
	Comprehension or Analysis	<u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): Requires student to calculate allowable yearly permissible dose using knowledge of yearly administrative dose limits at Perry.			

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**QUESTION 121**

The plant is operating at 100% reactor power when a piping elbow on the common discharge of the Turbine Building Closed Cooling (TBCC) pumps ruptures. The TBCC SURGE TANK LEVEL LOW alarm is locked in. TBCC Pump discharge pressure indications on panel H13-P870 are extremely low.

Which one of the following describes the immediate operator action(s) to be performed?

- A. Perform a fast reactor shutdown and transfer the Reactor Recirculation Pumps to slow speed.
- B. Perform a fast reactor shutdown and trip the Reactor Recirculation Pumps to OFF.
- C. Restore TBCC surge tank level by manually opening Two Bed M/U Wtr Cont Vlv Bypass Vlv, P44-F503 and reduce the TBCC heat load as soon as possible.
- D. Open TBCC HX SW TCV BYP, P41-F390 if failure of the TBCC heat exchanger outlet temperature control valve, P41-F003 is suspected.

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 4	
	K/A#	Gen 2.4.49	
	Importance Rating	4.0	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B – Recirc pumps are to be transferred to slow speed, not tripped off.</p> <p>C – A fast reactor shutdown is required, this is an ARI action for a low surge tank level.</p> <p>D – Incorrect ONI-P44 immediate action, it is not a temperature control problem.</p>			
Technical Reference(s): ONI-P44		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-002-P44 Obj E			
Question Source:	Bank # Modified Bank # New	<u>  422  </u> <u>          </u> <u>          </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>          </u> <u>  99-003  </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>          </u> <u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41 55.43	<u>  X  </u> <u>          </u>	
Comments (Why is it an upper level question): Requires student to analyze plant conditions, determine that a complete loss of TBCC exists, and then perform the correct immediate actions of the ONI.			

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**QUESTION 122**

The plant is operating at 100% reactor power when a complete loss of Instrument Air occurs.

Which one of the following describes the expected response for the following Feedwater System air-operated valves?

- |    |   |  |
|----|---|--|
| A. | MFP Full Flow Control Valve (N27-F010)<br>MFP Low Flow Control Valve (N27-F110)<br>MFP and RFP Recirculation Flow Control Valves<br>RFP Seal Injection Valves | Fails as-is<br>Fails closed<br>Fail open<br>Fail open  |
| B. | MFP Full Flow Control Valve (N27-F010)<br>MFP Low Flow Control Valve (N27-F110)<br>MFP and RFP Recirculation Flow Control Valves<br>RFP Seal Injection Valves | Fails as-is<br>Fails as-is<br>Fail close<br>Fail open  |
| C. | MFP Full Flow Control Valve (N27-F010)<br>MFP Low Flow Control Valve (N27-F110)<br>MFP and RFP Recirculation Flow Control Valves<br>RFP Seal Injection Valves | Fails as-is<br>Fails as-is<br>Fail close<br>Fail as-is |
| D. | MFP Full Flow Control Valve (N27-F010)<br>MFP Low Flow Control Valve (N27-F110)<br>MFP and RFP Recirculation Flow Control Valves<br>RFP Seal Injection Valves | Fails as-is<br>Fails as-is<br>Fail open<br>Fail open   |

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A#	295019 AA2.02	
	Importance Rating	3.6	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – MFP Low Flow Control Valve, N27-F110 fails as-is B – MFP and RFP Recirculation Flow Control Valves fail open C – RFP Seal Injection Valves fail open			
Technical Reference(s): ONI-P52		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-P51/52 Obj G, OT-3036-004-N27 Obj C & D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION JANUARY 2001  
REACTOR OPERATOR**

**QUESTION 123**

During a reactor startup, a single notch control rod withdrawal reduced the reactor period to 45 seconds.

Which one of the following describes the operator action(s) to be taken?

- A. Stop control rod withdrawal. Insert control rod(s) in the approved sequence, if necessary, to increase reactor period.
- B. Stop control rod withdrawal. Insert cram rod(s), if necessary, to increase reactor period.
- C. Control rod withdrawal can continue unless a reactor period of less than 30 seconds is observed.
- D. Control rod withdrawal can continue if the reactor period is deemed to be spurious in nature

**ANSWER: A**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 4	
	K/A#	GEN 2.4.10	
	Importance Rating	3.0	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>B – Cram rods are not the 'approved sequence'. Cram rods are inserted to notch position 00 to 04.</p> <p>C / D– This shorter period is only allowed during continuous rod withdrawal for approved testing instructions and is obviously spurious in nature. The question stem specifies that a reactor startup is in progress.</p>			
Technical Reference(s): ARI-H13-P680-6 (B1)		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3036-004-C51(SRM) Obj G			
Question Source:	Bank #	<u>  123  </u>	(Note changes or attach parent)
	Modified Bank #	<u>          </u>	
	New	<u>          </u>	
Question History:	Previous NRC Exam	<u>          </u>	
	Previous Quiz / Test	<u>          </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge	<u>          </u>	
	Comprehension or Analysis	<u>  X  (C)  </u>	
10 CFR Part 55 Content:	55.41	<u>  X  </u>	
	55.43	<u>          </u>	
Comments (Why is it an upper level question): Requires student to analyze plant conditions, recognize the SRM Short period alarm setpoint of 50 seconds, and then determine the correct operator actions to be performed.			



**U.S. NUCLEAR REGULATORY COMMISSION  
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REACTOR OPERATOR**

**QUESTION 124**

PEI-B13, RPV Control (ATWS) has been entered due to an ATWS with an MSIV isolation. The following plant conditions exist:

- Reactor power 10%
- Reactor pressure 800 psig
- Reactor water level + 115 inches
- Suppression Pool temperature 113 °F
- Drywell pressure 1.1 psig
- Number of SRVs open 2

Based on these plant conditions, which one of the following reactor water level bands is required by PEI-B13, RPV Control (ATWS) in order to lower reactor power?

- A. Restore and maintain reactor water level between +185 and +215 inches.
- B. Maintain reactor water level between -25 and + 215 inches.
- C. Maintain reactor water level between -25 inches and +100 inches.
- D. Maintain reactor water level between -25 and +25 inches if reactor power dropped below 4% at a reactor water level of +25 inches.

**ANSWER: D**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 4	
	K/A#	GEN 2.4.6	
	Importance Rating	3.1	
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – This is the reactor water level band specified by PEI-B13, RPV Control (Non-ATWS) when the reactor is shutdown.</p> <p>B – This is the reactor water level band specified by PEI-B13, RPV Control (ATWS) when the answer to the Override is NO and reactor power is &lt;4%.</p> <p>C - This is the reactor water level band specified by PEI-B13, RPV Control (ATWS) when the answer to the Override is NO and reactor power is &gt;4%.</p>			
Technical Reference(s): PEI-B13, RPV Control (ATWS), PEI Bases Document		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-06-11 Obj D			
Question Source:	Bank # Modified Bank # New	<u>      </u> <u>      </u> <u>  X  </u>	(Note changes or attach parent)
Question History:	Previous NRC Exam Previous Quiz / Test	<u>      </u> <u>      </u>	
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis	<u>      </u> <u>  X (A)  </u>	
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>      </u>		
Comments (Why is it an upper level question): Requires student to analyze plant conditions, and in conjunction with knowledge of reactor water level control during an ATWS, decide which reactor water level band is required.			

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION JANUARY 2001  
REACTOR OPERATOR**

QUESTION 125

Which one of the following PEI Alternate Injection methods would require the Turbine Building to be accessible in order for plant operators to perform local actions?

- A. CRD Alternate Injection
- B. Condensate Transfer Alternate Injection
- C. Alternate Injection via the FPCC Header using a Hotwell Pump
- D. Alternate Injection via the FPCC Header using the SPCU Pump

ANSWER: C

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #	3	
	Group #	Cat 4	
	K/A#	GEN 2.4.35	
	Importance Rating	3.3	
Proposed Question: See attached			
Proposed Answer: See attached			
Explanation (Why the distractors are incorrect): A – All required local actions are in the Intermediate Bldg B - All required local actions are in the Auxiliary Bldg D - All required local actions are in the Intermediate and Auxiliary Bldgs			
Technical Reference(s): PEI-SPI 4.3		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: None			
Learning Objective (As available): OT-3402-007-16 Obj D			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge <u>  X  </u> Comprehension or Analysis _____		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 _____		
Comments (Why is it an upper level question): N/A			

U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR

QUESTION 126

MCC-EF1A07, which supplies power to some RCIC components, has been lost. Shortly thereafter, a Loss of Coolant Accident (LOCA) occurred and RPV water level decreased below the RCIC initiation setpoint.

A step in PEI-B13, RPV Control (Non-ATWS) states: "Initiate any of the following which should have initiated: RCIC."

RCIC did not initiate.

Given these plant conditions, can the RCIC System be manually initiated from the Control Room?

- A. Yes; assuming all RCIC valves are in their normal standby lineup.
- B. Yes; all RCIC valves required to be open for RCIC to inject are DC powered.
- C. No; RCIC cannot be lined up for injection from the Control Room if the RCIC Turbine Steam Supply Valve, E51-F045, is closed.
- D. No; RCIC cannot be lined up for injection from the Control Room under any circumstances with a loss of AC power.

ANSWER: A

	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	217000 K6.01	
	Importance Rating		3.5

Proposed Question: See attached

Proposed Answer: See attached

Explanation (Why the distractors are incorrect):

B – The steam supply isolation valves (F063/F064) are AC-powered valves and, if closed, would not allow RCIC to be manually initiated.

C - The RCIC Turbine Steam Supply Valve (E51-F045) is DC powered and can be opened from the Control Room.

D - RCIC can be lined up from the Control Room to inject during a loss of AC when the RCIC System is in standby.

Technical Reference(s): SDM-E51

Reference Attached:   X  

(Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OT-3036-003-E51 Obj D

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

Question History:	Previous NRC Exam _____
	Previous Quiz / Test _____

Question Cognitive Level:	Memory or Fundamental Knowledge _____
	Comprehension or Analysis <u>  X  </u> (C) <u>  </u>

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

Comments (Why is it an upper level question): Requires student to assess the condition of the RCIC System, and in conjunction with the knowledge of RCIC valve power supplies, predict if RCIC can be manually initiated from the Control Room.

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION JANUARY 2001  
SENIOR REACTOR OPERATOR**

**QUESTION 127**

The plant is in MODE 1. The Division 1 Diesel Generator is in Secured Status. The Division 2 and 3 Diesel Generators are in Standby Readiness.

The on-shift Fire Protection Technician reports the following information for CO<sub>2</sub> storage tank 0P54-A008 for the Diesel Generator Rooms:

- Tank pressure                      300 psig
- Tank volume                      2000 lbs

Which one of the following statements is correct concerning 0P54-A008?

**PAP-1914, Attachment 4 is provided for reference.**

- A.                      0P54-A008 is OPERABLE because tank pressure and tank volume exceed the minimum requirements.
- B.                      0P54-A008 is inoperable because tank volume is less than the minimum tank storage volume requirement.
- C.                      0P54-A008 is inoperable because tank pressure is greater than the minimum tank storage pressure requirement.
- D.                      0P54-A008 is not required to be OPERABLE because the Division 1 Diesel Generator is in Secured Status.

**ANSWER: B**

<b>Examination Outline Cross-Reference</b>	Level:	RO	SRO
	Tier #		3
	Group #		Cat 4
	K/A#	GEN 2.4.25	
	Importance Rating		3, 4
Proposed Question: See attached			
Proposed Answer: See attached			
<p>Explanation (Why the distractors are incorrect):</p> <p>A – Tank volume does not exceed the minimum tank stored volume requirement of 2600 lbs.</p> <p>C – Tank pressure greater than 275 psig is the minimum tank storage pressure requirement; therefore, an actual tank pressure of 300 psig meets the OPERABILITY criteria.</p> <p>D – OP54-A008 is required to be OPERABLE whenever any diesel generator is required to be OPERABLE.</p>			
Technical Reference(s): PAP-1914, Attachment 4		Reference Attached: <u>  X  </u> (Attach if not previously provided)	
Proposed references to be provided to applicants during examination: PAP-1914, Attachment 4			
Learning Objective (As available): OT-3039-008-03 Obj A & E			
Question Source:	Bank # _____ Modified Bank # _____ New <u>  X  </u>	(Note changes or attach parent)	
Question History:	Previous NRC Exam _____ Previous Quiz / Test _____		
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>  X  </u> (A)		
10 CFR Part 55 Content:	55.41 <u>  X  </u> 55.43 <u>  X  </u>		
Comments (Why is it an upper level question): Requires student to make an OPERABILITY decision using available information provided.			