

# Wolf Creek Generating Station Initial License Written Exam December 2001

The following is the 125 questions generated in accordance with NUREG –1021, Rev. 8, Supplement 1 for the NRC Initial License Exam given to seven applicants.

The exam questions and pages are broken down as follows:

- Questions 1 – 75 are the common questions for both RO and SRO exams.
- Questions 76 –100 are RO only and labeled as such, RO76 – RO100.
- Questions 101-125 are SRO only and labeled as SRO76 – SRO100.

The following is a summary of changes made after presentation of the exam to the applicants. Changes made are noted on the question in *italic font*.

1. Question #5, changed wording in stem. Sprays ineffective at “reduced pressure” to “*reducing* pressure”, which was the intent of the question. This was a typo error but the words do have different meanings.
2. Question #47. Changed distracter “A” to read; “*Any SI pump flow to the RCS would provide adequate core cooling.*”
3. Question # SRO-86. Added clarification that *Gamma Metrics equals power range indication*. Adverse Containment is indicated by the conditions given. The Power Range instrument readings provided originally would not be valid. One applicant needed Gamma metrics to determine if entry to FR-S1 was required.

## Question Worksheet Common #1

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	000005	AK1.04
	Importance	3.0	3.4

### Proposed Question:

With the plant at 98% reactor power and Bank D control rods at 199 steps, which of the following is a symptom of a stuck control rod?

- A. Rods moving with Tave 3.2 degrees below Tref and Rod Control in Auto.
- B. A variation in NIS instrumentation resulting in a quadrant tilt of .997 %.
- C. An individual DRPI with a 13 step disagreement with the bank demand location.
- D. Power range detector N41 is 1.3% below the other 3 channels.

**Proposed Answer:** C, An individual DRPI with a 13 step disagreement with the bank demand location.

**Explanation:** Ans. A incorrect as rod movement is expected for Tave tracking Tref. Ans. B incorrect as power quadrant tilt of .997% is below the 1.02% limit and thus, not large enough for procedure entry or stuck rod indication. Ans. C correct as more than a 12 step misalignment will require procedure entry due to the axial imbalance. Ans. D incorrect as a flux deviation will occur due to a single dropped rod, but must be much larger than that given in distracter.

**Technical References:** OFN-SF011, Realignment of Dropped, Misaligned Rod(s) and Rod Control Malfunctions.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732421, obj. 2

**Question Source:** INPO EXAM BANK #2747 Modified

**Question History:** Point Beach (8/2/1999)

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (8) (10)  
55.43

**Comments:** Reactor Operator's understands safe operation of the reactor and control rods.

## Question Worksheet Common #2

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	000005	AK2.02
	Importance	2.5	2.6

### Proposed Question:

Given the following plant conditions:

- Control Bank D rods step counter at 185 steps.
- Auctioneered T-avg/ T-ref Deviation is +4 degrees F.
- Rod Control is in AUTO.
- Turbine Power is 78% and INCREASING at 1% per minute.
- ROD CONTROL URGENT FAILURE Annunciator is LIT.

Which ONE of the following actions is required?

- A. Ensure rod motion stops and stop any power changes in progress.
- B. Insert Control Bank D rods to recover T-avg.
- C. Stop Turbine Loading by depressing the HOLD pushbutton.
- D. Reset the alarm by depressing the Rod Control Alarm Reset pushbutton.

**Proposed Answer:** A, Ensure rod motion stops and stop any power changes in progress.

**Explanation:** Ans. A is correct as rod motion should stop on URGENT FAILURE. Ans. B incorrect because inserting rods would increase the T-avg/T-ref deviation and rods would need to be withdrawn to recover T-avg. Ans. C incorrect, because depressing this pushbutton rapidly changes turbine load and attempts to load to wherever the load set motor is programmed. Ans D, is incorrect since more actions are required to reset the alarm than just depressing the pushbutton and the reason for the alarm has not been determined.

**Technical References:** ALR 00-079A, ROD CTRL URG FAIL

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300100, obj 10 & 13

**Question Source:** INPO EXAM BANK #11031 Modified

**Question History:** Kewaunee (2/24/97)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Understanding of rod motion interlocks.

### Question Worksheet Common #3

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	000015	AK2.10
	Importance	2.8	2.8

#### Proposed Question:

All RCP pump bearing/seal inlet temperatures are stable.

Which of the following Total #1 Seal Flow indications would require you to perform an Immediate RCP Shutdown in accordance with OFN BB-005, "RCP Malfunctions"?

- A. Seal leakoff flow 3.0 gpm.
- B. Seal leakoff flow 1.0 gpm with #2 seal flow 0.0 gpm.
- C. Seal leakoff 2.0 gpm and increasing 1.0 gpm/hr.
- D. Seal leakoff flow 9.0 gpm.

**Proposed Answer:** D, Seal leakoff flow greater than 9.0 gpm.

**Explanation:** Foldout page requires immediate shutdown if Attachment E is exceeded. Attachment E requires immediate shutdown if bearing/seal inlet temp. is increasing and leakoff is less than 0.8 gpm or greater than 6 gpm. If leakoff is greater than 8 gpm, temperature is not a concern. Ans. A is a normal start criteria and not in the OFN. Ans. B and C are within threshold values only if temperature is also increasing. Ans. D is correct.

**Technical References:** OFN BB-005 Foldout Page and Attachment E table values.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300300, obj. 4

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** License candidates must know foldout criteria that require Immediate Actions to be taken.

**Question Worksheet Common #4**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	000017	AA1.03
	Importance	3.7	3.8

**Proposed Question:**

The plant is currently stable at 50% power.

Which of the following conditions would result in a RX PARTIAL TRIP annunciator and NOT result in a reactor trip?

- A. Loop 1 Reactor Coolant Pump shaft shear occurs.
- B. RCS Flow Transmitter FT-414 high pressure tap ruptures.
- C. Loop 2 Reactor Coolant Pump breaker opens.
- D. RCS Flow Transmitter FT-424 diaphragm ruptures.

**Proposed Answer:** D, RCS Flow Transmitter FT-424 diaphragm ruptures.

**Explanation:** Ans. A is incorrect as a shaft shear above P-8 will cause a trip. Ans. B is incorrect as a high pressure tap rupture will cause all three channels to fail low causing a reactor trip. Ans. C will result in a reactor trip above P-8. Answer D will only cause one channel to fail as the delta P goes to zero on only the failed channel.

**Technical References:** BD-OFN SB-008 and RCS drawing

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300202, obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A4

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Tests understanding of the power to flow trip system and the arrangement of high and low pressure taps for the flow transmitters.

**Question Worksheet Common #5**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	2
	K/A #	000027	AK1.01
	Importance	3.1	3.4

**Proposed Question:**

Given the following plant parameters during a Reactor Coolant System (RCS) heatup:

- RCS Average Temperature 195°F
- Pressurizer pressure 375 psig
- Pressurizer temperature 410°F
- Pressurizer level 455"

Pressurizer spray valves are opened and pressure remains constant.

Why are spray valves ineffective at *reducing* pressure?

- A. At this Press/Temp heat input is matching spray flow effectiveness.
- B. Subcooling is indicated in the pressurizer.
- C. Pressurizer spray flow is inadequate for current conditions.
- D. Pressurizer level of 455" is too high for a pressure reduction.

**Proposed Answer:** B, Subcooling is indicated in the pressurizer.

**Explanation** Ans. A is incorrect, since sprays would have the effect of reducing pressure with saturation conditions. Ans B. is correct since this indication, derived from using the steam tables, shows that a bubble is not drawn in the pressurizer. Ans. C is incorrect since a RCP will be running by this time during a plant heatup and will supply sufficient driving head to the spray valves. Ans. D is incorrect since pressure could still be maintained with this high level if a bubble were drawn in the PZR, but the given parameters show lack of bubble.

**Technical References:** GEN 00-02, Cold Shutdown to Hot Standby

**Proposed references to be provided to applicants during exam:** Steam Tables

**Learning Objective:** SY1301000, obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (8) (10)  
55.43

**Comments:** Operators are required to know how to determine when a steam bubble is drawn in the pressurizer.

## Question Worksheet Common #6

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	040 AK3.02	
	Importance	4.4	4.4

### Proposed Question:

The Unit was in MODE 3 at normal operating temperature and pressure when a faulted steam generator event occurs.

The following conditions exist:

- RCS hot leg temperatures: 495°F (A), 494°F (B), 487°F (C), 488°F (D)
- RCS cold leg temperatures: 491°F (A), 491°F (B), 484°F (C), 483°F (D)
- S/G steam flow: 850,000 lbm/hr (B)
- Containment pressure (Channel): 8 psig (1), 7.5 psig (2), 7.5 psig (3), 8 psig (4)

Based on these conditions, a Main Steam Line Isolation should have occurred because...

- A. of the low pressure in at least ONE S/G.
- B. the steamline high negative rate occurred in S/G "B".
- C. containment pressure is above the setpoint for the CTMT High-2 pressure signal.
- D. three S/Gs have pressures below the isolation setpoint and indicate high steam flow.

**Proposed Answer:** A, have occurred because of the low pressure in at least ONE S/G.

**Explanation:** Ans A. is correct since the steamline isolation signal is generated by the low pressure sensed on 2/3 pressure transmitters in any one SG. This is calculated by estimating the saturation of the secondary using RCS temperatures given. Ans C is incorrect using CTMT pressure which is below the MSLI setpoint of 17 psig. Ans. B is incorrect since steamline negative rate is blocked since initial condition has PZR pressure > P-11. Ans D is incorrect since only two steam generators indicate low pressure as derived from the Steam Tables and high steam flow is not occurring.

**Technical References:** EMG E-0, Reactor Trip or Safety Injection

**Proposed references to be provided to applicants during exam:** Steam Tables

**Learning Objective:** SY1301301, obj. 3

**Question Source:** INPO EXAM BANK # 3401 Modified

**Question History:** Braidwood (9/14/98)

**Question Cognitive Level:** Memory or Fundamental Knowledge A4  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5, 10)  
55.43

**Comments:** The Operator needs to understand when a MSLI is generated under varying conditions.

**Question Worksheet Common #7**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	000057	AA1.04
	Importance	3.5	3.6

**Proposed Question:**

The unit is stable at 100% power when Vital Instrument Bus NN01 (RED TRAIN) becomes de-energized.

If power to NN01 cannot be restored, which of the following actions will have to be taken to stop a plant transient?

- A. Lock AB PIC-4A, S/G “D” Atmospheric Relief Valve Manual Drive Lever in Closed.
- B. Ensure AC PT-505, High Pressure Turbine First Stage Pressure Channel, is selected.
- C. Close and de-energize BN HIS-112D, RWST Isolation to CCP Suction Valve.
- D. Place BG LK-149F, VCT Master Level Controller, setpoint at 70% and in AUTO.

**Proposed Answer:** C, Close and de-energize BN HIS-112D, RWST Isolation to CCP Suction Valve

**Explanation:** Ans. A is correct if NN04 is lost (PIC-1A for NN01). Ans. B is correct if NN02 is lost (PT-506 for NN01). Ans. D is incorrect since this controller is non-safety related. Ans. C is the only correct answer in that is supplied by NN01 (RED TRAIN).

**Technical References:** OFN NN-021 Attachment A, B and D

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732431. obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A4

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** The loss of bus causes the VCT level indication to fail if NN01 or NN04 is lost. This causes the respective RWST valve to open and VCT outlet to close. To prevent a negative reactivity addition, the operator must manually realign the proper RWST and VCT isolations and de-energize them in the correct position.



**Question Worksheet Common #8**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	000068	AK2.07
	Importance	3.3	3.4

**Proposed Question:**

The unit is in Mode 1 with all systems operating normally.

The Shift Manager now determines that the Control Room must be evacuated due to dense smoke from the control panels.

Following this evacuation, which Diesel Generator will be used and how will it be loaded?

- A. Diesel Generator “A”, loaded manually.
- B. Diesel Generator “A”, loaded automatically.
- C. Diesel Generator “B”, loaded manually.
- D. Diesel Generator “B”, loaded automatically.

**Proposed Answer:** C, Diesel Generator “B”, loaded manually.

**Explanation:** On a control room evacuation due to a fire the “A” train equipment is disconnected. The RO will then manually strip and manually re-load “B” train equipment making Ans. C correct. Ans. A and B are incorrect as the “A” Diesel will be shutdown. Ans. D incorrect as the Diesel “B” will be loaded manually in this situation.

**Technical References:** OFN RP-017, Control Room Evacuation

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732427, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Must determine the correct action in regards to ED/G given a control room fire.

## Question Worksheet Common #9

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	<b>Tier #</b>	<b>1</b>	<b>1</b>
	<b>Group #</b>	1	1
	<b>K/A #</b>	000069	AA1.03
	<b>Importance</b>	2.8	3.0

### Proposed Question:

Which ONE of the following situations violates a requirement for containment integrity or containment closure?

- A. A containment vent is performed with the plant operating at 100% power.
- B. The plant is in hot standby. EF HV-33, Essential Service Water supply to Containment Air Coolers, is stuck open.
- C. The plant is in refueling mode with the refueling cavity flooded and no fuel movement in progress. Steam generator safeties have been removed.
- D. The plant is in refueling mode with fuel movement in progress. Containment Shutdown purge is initiated.

**Proposed Answer:** B, The plant is in hot standby. EF HV-33, Essential Service Water supply to Containment Air Coolers, is stuck open.

**Explanation:** Ans. A is incorrect, because a containment vent can and does occur as long as the vent release is monitored. Ans. B is correct since containment isolation will be affected by the failure of a valve on one side of the containment wall in Modes 1-4. Ans. C is incorrect since fuel movement is not in progress and there is no containment opening. Ans. D is incorrect, since a containment purge is allowed to be running per T.S. 3.6.3

**Technical References:** Wolf Creek Tech. Spec. 3.6.3 and its bases; USAR Figure 6.2.4-1, page 50 of 74

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1610710

**Question Source:** INPO EXAM BANK # 1103 Bank

**Question History:** Callaway (2/24/1997)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operator needs to know various components that affect Containment Integrity.

**Question Worksheet Common #10**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	W E07 EK3.1	
	Importance	3.1	3.7

**Proposed Question:**

The plant has experienced a Loss of Coolant Accident (LOCA).

Why are you required to align the plant for Hot Leg Recirculation 10 hours after the initiation of the LOCA?

- A. If the LOCA is a cold leg break, boron plateout will inhibit heat transfer in the core shortly after 10 hours.
- B. If the LOCA is a Pressurizer steam space LOCA, boron plateout will inhibit heat transfer in the core shortly after 10 hours.
- C. The core heat production is low enough after 10 hours to allow hot leg injection to quench the potential steam bubble in the core.
- D. The Steam Generators cannot remove core decay heat due to the reduced heat load, making break flow more important for heat removal.

**Proposed Answer:** A, If the LOCA is a cold leg break, boron plateout will inhibit heat transfer in the core shortly after 10 hours.

**Explanation:** Ans. A is correct since hot leg injection is needed to prevent boron precipitation from occurring in the core 10 hours into the LOCA event. Ans. B is incorrect as the Cold Leg break is the one of concern. Ans. C is incorrect, since cold leg injection is still injecting, reducing the chances of a steam bubble. Ans. D is not correct as Hot Leg recirc is only done for a large break LOCA in which the Steam Generators are not available for heat removal.

**Technical References:** EMG E-1, Loss of Reactor or Secondary Coolant; BD-EMG E-1, Background Document for Loss of Reactor or Secondary Coolant.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732317

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Operators need to know how to maintain heat removal in the core following all postulated events.

## Question Worksheet Common #11

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	W E08 EK1.1	
	Importance	3.5	3.8

### Proposed Question:

Following a LOCA initiated at full power, the Shift Engineer recommends an entry into EMG FR-P1, Response to Imminent Pressurized Thermal Shock Condition based on the rapid cooldown and low RCS cold leg temperatures. After you enter EMG FR-P1, you can exit the procedure if RCS pressure is less than 300 psig and you have greater than 500 gpm of RHR flow.

Why are you allowed to exit under these conditions?

- A. The cooldown cannot be stopped at this low pressure and high RHR flow.
- B. The vessel thermal shock will not result in crack propagation causing reactor vessel failure.
- C. Due to the size of the LOCA the temperature on the cold legs is not accurate.
- D. The differential pressure across the vessel is minimized due to high containment pressure.

**Proposed Answer:** B, The vessel thermal shock will not result in crack propagation causing reactor vessel failure.

**Explanation:** Ans. A is true but it is also true for some other events which cause entry into P1 such as steam breaks. Ans. B is correct based on the EMG background documents. Ans. C is not true. The SI flow read on the indicators is close to the downcomer temperature. Ans. D is a true statement but not a reason for exiting P1.

**Technical References:** EMG FR-P1 step 1 and BD FR-P1

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732349, obj.1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (8, 10)  
55.43

**Comments:** Candidate needs to understand what causes PTS and actions to take if PTS is not a concern as following a Large Break LOCA.

## Question Worksheet Common #12

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	W E09 EK3.1	
	Importance	3.3	3.6

### Proposed Question:

You have just started a natural circulation cooldown using EMG ES-04, NATURAL CIRCULATION COOLDOWN.

The following indications exist:

- T-hot 540°F and decreasing
- T-cold 510°F and decreasing
- Subcooling 80°F
- Cooldown rate 45°F/Hr
- Pressurizer Level 25% and slowly decreasing
- All Control Rod Drive Mechanism (CRDM) fans running

The RCS is being depressurized to maintain the Cooldown curve limits.

Which of the following conditions would require you to re-pressurize the RCS?

- A. One CRDM fan trips and cannot be restarted.
- B. Subcooling decreases to 70°F.
- C. Large unexpected variations in PZR level.
- D. RVLIS natural circulation range is 98%.

**Proposed Answer:** C, Large unexpected variations in PZR level.

**Explanation:** Ans. A requires you to stop depressurization and hold pressure until 125 °F subcooling is established. Ans. B is same as A but only until 75 °F subcooling exists. Ans. C is indication of voids in the vessel and require re-pressurization to collapse voids. Ans. D is incorrect requiring no action unless RVLIS indicates greater than 95%.

**Technical References:** EMG ES-04 and BD EMG ES-04

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732317, obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (5, 10)  
55.43

**Comments:** Candidates are required to know indications of vessel head voiding and importance of taking quick action to stop the void from growing.

### Question Worksheet Common #13

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	W E10 EA1.1	
	Importance	3.8	3.6

#### Proposed Question:

While performing a Natural Circulation cooldown using EMG ES-05, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITHOUT RVLIS), conditions are established for starting an RCP.

- RCS subcooling > 70°F
- Pressurizer level > 88%
- Pressurizer is saturated

What are the consequences of starting an RCP without meeting the above requirements?

- A. If the Pressurizer is not saturated, starting an RCP can cause a sudden loss of pressure.
- B. Pressurizer level may be lost if an RCP is started with less than the required level.
- C. Starting an RCP without subcooling will propagate (add) voids in the RCS piping.
- D. Damage to an RCP will occur without all 3 required conditions in the appropriate range.

**Proposed Answer:** B, Pressurizer level may be lost if an RCP is started with less than the required level.

**Explanation:** Ans. A sounds good but overpressure is the concern if starting an RCP in a solid plant. Ans. B is correct. Ans. C void formation is a concern in the vessel head, starting an RCP will clear any voids in the piping. Ans. D is incorrect since not meeting these conditions will not necessarily damage the pump.

**Technical References:** EMG ES-05 and BD EMG ES-05 page 21

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732317 obj. 5 & 7

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Tests understanding of effect of starting an RCP while on Natural Circulation with a potential bubble in the Reactor Vessel.

**Question Worksheet Common #14**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	000001	AK2.08
	Importance	3.1	3.0

**Proposed Question:**

You are withdrawing Control Bank “A” rods in accordance with GEN 00-003, Hot Standby to Minimum Load to take the reactor critical. You stop the rod withdrawal at 50 steps but the step counters continue to count after you have released the rod control switch.

Which of the following indications would confirm continuation of rod withdrawal?

- A. An increase in T-avg.
- B. Control Bank “A” DRPI would continue to change.
- C. Source range Startup Rate would continue to increase.
- D. An increase in Pressurizer level.

**Proposed Answer:** B, Control Bank “A” DRPI would continue to change.

**Explanation:** Ans. A and D will not reflect reactor power change until the point of adding heat. Ans. C will not occur when pulling control bank A initially. Ans. B would confirm rod withdrawal.

**Technical References:** GEN 00-003 page 26

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301400, obj. 4, 7, and 10

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A4

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** All of the indications are valid for continuous rod withdrawal at power but only the correct answer is valid while pulling the Control Bank A rods.

**Question Worksheet Common #15**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	003 AK1.10	
	Importance	2.6	2.9

**Proposed Question:**

Given the following:

- The Unit is at 100 % power.
- One rod in control Bank C dropped.
- Tav<sub>g</sub> has been restored to 100% of program value.
- Axial Flux Difference (AFD) is + 2.0%.

WHICH ONE (1) of the following conditions will result from the dropped rod event?

- A. Quadrant power tilt ratio will increase.
- B. The Rod Insertion Limit (RIL) will decrease.
- C. AFD will decrease from its present value.
- D. Shutdown margin will increase.

**Proposed Answer:** A, Quadrant power tilt ratio will increase.

**Explanation:** Ans. A is correct since Control Bank “C” has no central rod and flux will tilt. Ans. B and C are incorrect since they deal with the entire bank of control rods. Ans. D is incorrect as SDM will actually decrease.

**Technical References:** Page# 1.2 of the “Curves and Tables” book

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300100, obj. 13; LO1732421, obj. 4

**Question Source:** INPO EXAM BANK # 2964 Bank

**Question History:** Watts Barr (2/26/96)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (8, 10)  
55.43

**Comments:** Candidate recognizes when power tilt will occur.



**Question Worksheet Common #16**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	008 AK1.02	
	Importance	3.1	3.7

**Proposed Question:**

The reactor has tripped from full power and one Pressurizer PORV opened following the reactor trip resulting in an SI actuation. The PORV has stuck open and all attempts to close it or its block valve have failed.

You are reporting the trend as recorded on BB PR-403, RCS WR Pressure Recorder and note that the rate of RCS pressure decrease slowed over a 30 minute period and then the rate suddenly increased.

What caused this to happen?

- A. The PORV closed momentarily due to the low pressure and then reopened.
- B. SI flow increased as the pressure decreased causing a momentary increase in pressure.
- C. The pressure in the PRT increased until the rupture disc failed allowing break flow to increase.
- D. Containment cooling caused containment pressure to decrease allowing break flow to increase.

**Proposed Answer:** C, The pressure in the PRT increased until the rupture disc failed allowing break flow to increase.

**Explanation:** Ans. A would stop the pressure decrease not reduce it. Ans. B sounds good but if this happened the pressure decrease would not increase again. Ans. C is correct since PRT pressure increases decreasing flow (and pressure drop) until the rupture disc fails and then pressure goes to containment pressure allowing the rate of decrease to increase. Ans. D would take a long time to occur as containment pressure is not very high during this event.

**Technical References:** ALR 00-034E, PRT PRESS HI

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732313

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (8, 10)  
55.43

**Comments:** Operators need to be able to apply fundamentals to plant operation to prevent mis-operation.

**Question Worksheet Common #17**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	008 AK2.02	
	Importance	2.7	2.7

**Proposed Question:**

The unit is operating at 75% power when the condensate pot for BB LT-459, Pressurizer Level Reference Leg, ruptures.

Assuming BB LT-459 is selected as the controlling transmitter in the control room, how will the plant respond?

- A. Indicated level DECREASES, charging INCREASES, heaters turn ON.
- B. Indicated level DECREASES, charging INCREASES, heaters turn OFF.
- C. Indicated level INCREASES, charging DECREASES, heaters turn ON.
- D. Indicated level INCREASES, charging DECREASES, heaters turn OFF.

**Proposed Answer:** C, Indicated level INCREASES, charging DECREASES, heaters turn ON.

**Explanation:** When the indicated pressurizer level as the controlling channel fails high charging lowers and PZR heaters turn on due to a possible insurge, making C the correct answer. Misconceptions can be due misinterpreting what happens on a leak in the reference leg which makes the instrument fail high, or believing that “actual level” will be the controlling parameter – these are the other distracters.

**Technical References:** BD-OFN SB-008, Instrument Malfunctions Background Document

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301000, obj. 10

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A4

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators must be able to quickly determine instrument failures and automatic functions that are affected.

**Question Worksheet Common #18**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	009 EA2.10	
	Importance	3.1	3.7

**Proposed Question:**

Given the following containment history with a small LOCA in progress:

<u>Time</u>	<u>Cnmt. Temp.</u>	<u>Cnmt. Press.</u>	<u>Cnmt. Humidity</u>	<u>Cnmt. Radiation</u>
0815	178 Deg F	2 psig	90%	9.0 X 10E4 R/Hr
0830	180 Deg F	4 psig	100%	7.3 X 10E5 R/Hr
0845	183 Deg F	5 psig	100%	9.5 X 10E5 R/Hr
0900	185 Deg F	10 psig	100%	2.0 X 10E6 R/Hr

Which ONE of the following describes the EARLIEST time at which adverse containment should have been declared?

- A. 0815
- B. 0830
- C. 0845
- D. 0900

**Proposed Answer:** B, 0830

**Explanation:** Containment pressure must be greater than 5 psig or greater than 10E5 R/Hr to declare adverse conditions in the containment. This condition is met at 0830.

**Technical References:** EMG F-0, Critical Safety Function Status Trees (CSFST), page 4.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732338, obj. 3

**Question Source:** INPO EXAM BANK # 5138 Bank

**Question History:** Farley (10/23/95)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** Adverse conditions in the containment criteria.

**Question Worksheet Common #19**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	022 AA1.02	
	Importance	3.0	2.9

**Proposed Question:**

The following Annunciators are in alarm:

- 00-041A, SEAL INJ TO RCP FLOW LO
- 00-042A, CHG LINE FLOW HILO

Shortly thereafter, the Normal Charging Pump trips on overcurrent.

Which of the following actions should be taken immediately?

- A. Start an alternate charging pump after verifying its suction path.
- B. Restart the Normal Charging Pump after resetting the overcurrent trip.
- C. Secure letdown and initiate an investigation for the loss of the Normal Charging Pump.
- D. Secure letdown and start an alternate charging pump, then restore letdown.

**Proposed Answer:** D, Secure letdown and start an alternate charging pump, then restore letdown.

**Explanation:** Ans. D is the proper response, which is to stop letdown, start a pump, then restore letdown. The operators are also required to maintain seal injection flow to the RCPs. Ans. A is incorrect, since this may cause a temperature shock of regen hx. Ans. B is wrong due an investigation needed prior to resetting the overcurrent. Ans. C is wrong since some form of RCS makeup is still required.

**Technical References:** ALR 00-42A, CHG LINE FLOW HILO

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300400

**Question Source:** INPO EXAM BANK #3204 Bank

**Question History:** Waterford (09/06/1996)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Actions on a loss of RCS makeup.

**Question Worksheet Common #20**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	025 AK2.03	
	Importance	2.7	2.7

**Proposed Question:**

The following plant conditions exist:

- The plant is in Mode 5.
- Residual Heat Removal (RHR) Train “A” is in service.
- A Loss of Offsite power occurs.
- Both Emergency Diesel Generators start and load onto their respective bus.
- Train “A” Essential Service Water Pump fails to start, and all attempts to start it fail.

Which ONE of the following operator actions should be performed for these conditions?

- A. Line up and start RHR Train “B”.
- B. Restart RHR Train “A”.
- C. Line up and start Safety Injection Pump “B”.
- D. Cross tie Essential Service Water to Train “B”.

**Proposed Answer:** A, Line up and start RHR Train “B”.

**Explanation:** Ans. B. is incorrect since this will not regain RHR. Ans. C. is incorrect since this will over pressurize system. Ans. D. is incorrect since it is not allowed per procedure. Ans. A. is correct since this the quickest and follows the procedure.

**Technical References:** OFN EJ-015, Loss of RHR Cooling

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732425, obj. 3

**Question Source:** INPO EXAM BANK # 6126 Bank

**Question History:** Davis Besse (8/03/98)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators need to know what to do on a loss of RHR cooling.

**Question Worksheet Common #21**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	029 EK1.02	
	Importance	2.6	2.8

**Proposed Question:**

Based on the current plant cycle core physics, why is it worse for an ATWT event to occur at low power at the Beginning Of Life (BOL) conditions?

- A. The higher SG pressures at lower power remove heat from the RCS at a LOWER RATE; therefore, RCS temperatures RISE to a higher level.
- B. The high boron concentration causes the emergency boration to be LESS EFFECTIVE; therefore taking a LONGER time to achieve adequate Shutdown Margin (SDM).
- C. The Moderator Temperature Coefficient (MTC) is MORE POSITIVE at lower power; therefore, the expected heat addition INCREASES reactor power.
- D. The additional burnable poisons provide LESS heat conduction at lower power; therefore, the fuel pin outer clad temperatures are HIGHER.

**Proposed Answer:** C, The Moderator Temperature Coefficient (MTC) is MORE POSITIVE at lower power; therefore, the expected heat addition INCREASES reactor power.

**Explanation:** Ans. B is plausible due to the high boron concentration at BOL. Ans. A. is plausible since candidate may believe that higher pressures constitute higher temperatures, however pressure is a constant. Ans. D is plausible since there is an increased amount of burnable poisons at BOL, but it does not affect clad temperatures. Ans. C is the correct answer due to the fact that a positive MTC adds more reactivity as temperature is increased at BOL.

**Technical References:** BD-EMG FR-S1, Response to Nuclear Power Generation/ATWT; GEN 00-003, Hot Standby to Minimum Load

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO173103, LO1732339

**Question Source:** INPO EXAM BANK #3490 Bank

**Question History:** Braidwood (10/16/97)

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41(8, 10)  
55.43

**Comments:** Candidate should know why an ATWT is worse at BOL

**Question Worksheet Common #22**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	033 AK3.02	
	Importance	3.6	3.9

**Proposed Question:**

Given the following plant conditions:

- A plant startup is in progress
- Source range instrument N31 indicates  $3.0 \times E4$  counts per second
- Source range instrument N32 indicates  $3.5 \times E4$  counts per second
- N35 intermediate range instrument now fails offscale low.

Which ONE of the following actions must be performed?

- A. Restore N35 to operation prior to exceeding  $1.0 \times E-10$  amps.
- B. Reduce reactor power to less than  $5 \times E-11$  amps.
- C. Trip the reactor and stabilize the unit with EMGs.
- D. Place N35 Level Trip Bypass in Bypass and continue the Startup.

**Proposed Answer:** A, Restore N35 to operation prior to exceeding  $10E-10$  amps.

**Explanation:** Ans. A is correct per T.S. and the OFN. Ans. B is incorrect because a power reduction is not required. Ans. C is incorrect because the source ranges are still energized and valid. Ans. D is incorrect because Intermediate Ranges are required above P-6.

**Technical References:** OFN SB-008 BD OFN SB-008 Attachment Q (Intermediate Range) . T.S. 3.3.1

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732418, obj. 3

**Question Source:** INPO EXAM BANK # 4083 Bank

**Question History:** Surry (8/4/97)

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5, 10)  
55.43

**Comments:** Operator must know what actions to take on a failure of a power instrument.

## Question Worksheet Common #23

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	037 AA2.12	
	Importance	3.3	4.1

### Proposed Question:

The following conditions exist:

- Unit is at 100% power
- NO load changes are in progress
- S/G Levels 50% NR and stable
- CVCS Regenerative Heat Exchanger flow 58.4 gpm
- Charging Line flow 92 gpm
- Letdown flow 75 gpm
- Seal Injection flow 8.4 gpm per RCP
- Seal Leakoff flow 3.8 gpm per RCP
- Pressurizer Level 57% and stable
- VCT Level 42% and decreasing by 5.3% per hour

A Steam Generator Tube Leak is suspected due to increasing trends on applicable radiation monitors.

What leak rate can be determined given the above indications?

- A. 0.8 gpm
- B. 1.8 gpm
- C. 3.4 gpm
- D. 7.6 gpm

**Proposed Answer:** B, 1.8 gpm

**Explanation:** Ans. A is incorrect due to a math error, but plausible. Ans. B is correct using the charging vs. letdown mismatch. Ans. C is incorrect using wrong values to calculate the leakrate, but could be calculated. Ans. D is least plausible, wrong values and math error required to obtain.

**Technical References:** OFN BB-007, RCS Leakage High and OFN BB07A Steam Generator Tube Leakage

**Proposed references to be provided to applicants during exam:** Calculator and paper

**Learning Objective:** LO1732417

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** Operators need to be able to perform a simple charging vs. letdown mismatch calculation to estimate a primary to secondary leak.



## Question Worksheet Common #24

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	054 AK1.02	
	Importance	3.6	4.2

### Proposed Question:

The plant has tripped due to a total loss of feedwater.

- EMG FR-H1, Response to Loss of Secondary Heat Sink, has been entered
- Bleed and Feed has been initiated
- Turbine Driven AFW pump has just been restored
- You are preparing to commence feeding a Steam Generator (S/G).

Which of the following conditions would allow you to feed all S/Gs at the same time?

- A. Core exit TCs decreasing and RCS hot leg temperatures 560°F.
- B. Core exit TCs increasing and all S/G wide range levels 11%.
- C. RCS hot leg temperatures 540°F and all S/G wide range levels 11%.
- D. RCS hot leg temperatures 525°F and all S/G wide range levels 5%.

**Proposed Answer:** C, RCS hot leg temperatures 540°F and all S/G wide range levels 11%.

**Explanation:** Ans. A is incorrect, this is a hot, dry S/G situation evidence by the high Thot. Ans. B assumes hot, dry S/Gs as Thermocouple temperature is increasing. Ans. C is correct below the hot, dry S/G threshold and would enable S/G feeding. Ans. D S/G levels are below limits to feed all S/Gs.

**Technical References:** EMG FR-H1 step 38 and BD EMG FR-H1 step 38

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732346, obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A4

**10 CFR Part 55 Content:** 55.41 (8, 10)  
55.43

**Comments:** Candidates must know and apply the definition of Hot, dry S/G to answer this question.

## Question Worksheet Common #25

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	054 AK3.01	
	Importance	4.1	4.4

### Proposed Question:

Which ONE of the following describes the basis for the Steam Generator (S/G) Low Level Reactor Trip?

The Steam Generator Low Level Reactor Trip prevents...

- A. primary and secondary pressures exceeding 110% of their design values.
- B. DNBR from going above 1.3 with minimum reactivity feedback and a loss of pressurizer pressure control.
- C. excessive thermal stress on the S/G shell when AFW flow is restored which could cause failure of the S/G tube sheet.
- D. water relief out the PZR PORVs or safeties which could cause primary system variables to approach DNB parameters.

**Proposed Answer:** D, The Steam Generator Low Level Reactor Trip prevents causing water relief out the PZR PORVs or safeties which could cause primary system variables to approach DNB parameters.

**Explanation:** Ans. A incorrect, since safeties will protect primary and secondary systems. Ans. B incorrect as heatup in this condition would give reactivity feedback. Ans. C is incorrect, since the tube sheet is designed to handle this event. Ans. D is correct, since this will cause a loss of heat sink and inability to keep the primary depressurized and cool.

**Technical References:** Updated Safety Analysis Report, Section 15.2.7

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1610707, obj.1

**Question Source:** INPO EXAM BANK #4840 Bank

**Question History:** Turkey Point (8/7/98)

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5) (10)  
55.43

**Comments:** Operators need to know the basis for steps in the Emergency procedures.

## Question Worksheet Common #26

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	058 2.2.25	
	Importance	2.5	3.7

### Proposed Question:

What is the normal status of the spare 125V DC distribution system battery charger in Mode 4?

- A. It is de-energized but capable of being placed in service within 2 hours if needed.
- B. It is de-energized but capable of being placed in service within 10 hours if needed.
- C. It is energized and capable of being placed in service within 2 hours if needed.
- D. It is energized and capable of being placed in service within 10 hours if needed.

**Proposed Answer:** C, It is energized and capable of being placed in service within 2 hours if needed.

**Explanation:** T.S. bases assumes the spare charger is energized and can be aligned within 2 hours if needed. Ans. A and B are incorrect as they specify de-energized. Ans. D is incorrect as it specifies 10 hours.

**Technical References:** T.S. Bases B.3.8.4 page 3

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732701, obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (2)

**Comments:** Demonstrates understanding of DC power T.S. bases.

## Question Worksheet Common #27

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	W E02 EA1.2	
	Importance	3.6	3.8

### Proposed Question:

The operators are conducting EMG C-0 (LOSS OF ALL AC POWER) and **NO** AC power has been restored. A Safety Injection Signal (SIS) is then received.

Which one of the following describes the actions required concerning the SIS?

- A. Allow it to remain in effect to ensure rapid initiation when power is restored.
- B. Allow it to remain in effect to provide an auto start signal for the diesel when it becomes available.
- C. Reset the SIS to provide diesel engine cooling.
- D. Reset the SIS to allow manual loading of equipment on an ESF bus when it becomes available.

**Proposed Answer:** D, Reset the SIS to allow manual loading of equipment on an ESF bus when it becomes available.

**Explanation:** Ans. A and B are incorrect since any kind of rapid loading after just getting a power supply restored could result in losing that power supply, but these items could be chosen if operator believes the automatic actions of an SIS will place the load on the bus smoothly without overloading the bus. Ans. C chosen to allow those who believe that the ESW pump would be shed on the SIS and therefore would need to be started. Ans. D is correct since rapid loading could be detrimental to the system after just getting power restored.

**Technical References:** EMG C-0, step 40, Loss of all AC Power; EMG ES-03 SI Termination

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732329, obj. 4

**Question Source:** 1997 Creek NRC Exam #056 Bank

**Question History:** Wolf Creek (1997)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operator must know how to deal with ESF loads when regaining control of the plant using Emergency procedures.

**Question Worksheet Common #28**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	W E05 EK2.1	
	Importance	3.7	3.9

**Proposed Question:**

With the plant at 40% power which one of the below would be TRUE regarding operation of the ATWS Mitigation Actuation Circuitry (AMSAC)?

- A. If levels decrease to 5% on 3 of 4 Steam Generators, then a Turbine Trip and MD AFAS are actuated 25 seconds later.
- B. If levels decrease to than 5% on 2 of 4 Steam Generators, then a Turbine Trip and MD AFAS are actuated 232 seconds later.
- C. If levels decrease to 23.5% on 3 of 4 Steam Generators, then a Turbine Trip and MD AFAS are actuated 25 seconds later.
- D. If levels decrease to than 23.5% on 2 of 4 Steam Generators, then a Turbine Trip and MD AFAS are actuated 232 seconds later.

**Proposed Answer:** A, If levels decrease to less than 5% on 3 of 4 Steam Generators, then a Turbine Trip and MD AFAS are actuated 25 seconds later.

**Explanation:** Ans. A correct since the listed conditions are true for AMSAC initiation. Ans. B is incorrect, because the logic of 2 of 4 and the time delay are wrong, though the examinee may pick this since 2 of 3 AMSAC “logic trains” initiated by the LO-LO Steam Generator levels cause the trip. Ans. C and D are incorrect because the S/G level set point of 23.5% is for the Reactor Trip, not AMSAC.

**Technical References:** ALR 00-083A, ATWS SG LEV PRE TRIP, ALR 00-085A, SG LOLO RX TRIP

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1406500, obj. 3

**Question Source:** INPO EXAM BANK # 1060 Bank

**Question History:** Callaway (2/24/1997)

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators need to know AMSAC trip criteria.

**Question Worksheet Common # 29**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	W E11 EK3.1	
	Importance	3.3	3.9

**Proposed Question:**

Following a large break Loss of Coolant Accident (LOCA), Refueling Water Storage Tank (RWST) swap over has failed to occur.

At what RWST level are you required to secure all Emergency Core Cooling System (ECCS) pumps?

- A. 6%
- B. 12%
- C. 28%
- D. 36%

**Proposed Answer:** A, 6%

**Explanation:** Ans. A correct since the procedure does require shutdown of the pumps at this level to prevent pump damage. Ans. B is incorrect, but is the point at which Containment Spray should be aligned for recirculation. Ans. C is not an option in the procedure. Ans. D is a determination point on how many Containment Spray pumps can be running.

**Technical References:** EMG ES-12, Transfer to Cold Leg Recirculation; EMG C-11 Loss of Emergency Coolant Recirculation

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732332, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5) (10)  
55.43

**Comments:** The Operator should know what constitutes a Loss of Emergency Coolant Recirculation.

**Question Worksheet Common #30**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
	K/A #	028 AK2.03	
	Importance	2.6	2.9

**Proposed Question:**

Given the following plant conditions:

- The unit is operating at 75% power.
- All control systems are in automatic.
- T-avg input to the Pressurizer Master Level Controller has failed at 562.5 °F.

Which one of the following would be the resultant pressurizer level?

- A. 27%
- B. 32.6%
- C. 45.7%
- D. 57%

**Proposed Answer:** B, 32.6%

**Explanation:** Ans. A is the level that would be maintained at no-load Tavg. Ans. B is the load pressurizer level for 562.5 and the correct answer. Ans. C. is incorrect as derived by taking the percentage difference of no load T-avg and existing T-avg, then adding that corresponding level to no load level. Ans. D is the 100% power pressurizer level setpoint.

**Technical References:** Pressurizer Level Program simplified drawing

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301000, obj. 5

**Question Source:** INPO EXAM BANK # 1005 Bank

**Question History:** Farley (3/12/98)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Tests reason for OFN sequence of restoration and response of system to various failures.

**Question Worksheet Common #31**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
	K/A #	056 AK1.01	
	Importance	3.7	4.2

**Proposed Question:**

Given the following conditions:

- The plant was operating at 100% power when a Loss of Offsite power occurred.
- The crew has stabilized the Reactor Coolant System in accordance with EMGs.
- Over the next several hours, Auxiliary Feedwater flow is decreased to maintain proper Narrow Range levels.

WHICH ONE of the following describes the reason for this change?

- A. Decay heat is decreasing.
- B. Auxiliary steam loads are being secured.
- C. A Steam Generator tube leak is developing.
- D. Condensate Storage Tank level is being conserved.

**Proposed Answer:** A, Decay heat is decreasing.

**Explanation:** Ans B and C would cause insignificant increases in S/G levels. Ans D is at the discretion of CRS and not a mandatory procedure step. Ans A shows less flow required due to lack of heat removal required over time.

**Technical References:** EMG ES-02, Reactor Trip Response, USAR Figure 15.2-18

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1610721, obj. 5

**Question Source:** INPO EXAM BANK # 1281 **Bank**

**Question History:** North Anna (1/26/96)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis **A2**

**10 CFR Part 55 Content:** 55.41 (8, 10)  
55.43

**Comments:** Operator has an understanding of decay heat removal by natural convection in the S/G.



**Question Worksheet Common #32**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	003 K2.02	
	Importance	2.5	2.6

**Proposed Question:**

The Component Cooling Water (CCW) Train "A" has been declared inoperable due to a piping rupture on the discharge of the heat exchanger.

The Unit is at 50% power decreasing from full power when the supply breaker for 4.16kv bus NB02 trips due to a bus fault.

Which of the following actions must be taken?

- A. Stabilize the plant until power is restored to the bus.
- B. Trip the reactor and then trip the Reactor Coolant Pumps.
- C. Trip the reactor and initiate a Safety Injection.
- D. Within 1 hour initiate action to place the Unit in Mode 3.

**Proposed Answer:** B, Trip the reactor and then trip the Reactor Coolant Pumps.

**Explanation:** All CCW has been lost due to the electrical fault and the fault cannot be cleared in time to prevent tripping RCPs. Ans. A. is incorrect as a reactor trip is in order. Ans. B is correct due to loss of CCW to the RCPs. Ans. C is incorrect as there is no need for SI. Ans. D. T.S. 3.0.3 .is applicable, damage to the RCPs is the over riding concern.

**Technical References:** OFN EG-004, CCW System Malfunctions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1400800, obj. 10

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Loss of the vital bus causes total loss of CCW, which requires RCPs to be tripped due to loss of cooling to the oil coolers.

**Question Worksheet Common #33**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	003 K5.03	
	Importance	3.1	3.5

**Proposed Question:**

The plant is stable at 20% with all systems properly aligned in automatic when one Reactor Coolant Pump is stopped.

What will happen to the temperature in the loop that contains the idle Reactor Coolant Pump?

- A. T-avg will increase because the Steam Generator will stop steaming.
- B. T-cold will increase to T-hot as the loop  $\Delta T$  goes to almost zero.
- C. T-hot will decrease to T-cold in the idle loop causing a reduction in steam flow.
- D. T-cold will decrease because the Steam Generator will continue to steam.

**Proposed Answer:** C, T-hot will decrease to T-cold in the idle loop causing a reduction in steam flow.

**Explanation:** Ans. A is incorrect as the Tavg will decrease due to backflow in the idle loop. Ans. B is incorrect as backflow will occur reducing Thot, not increasing Tcold. Ans. C is correct due to backflow and some steaming of the S/G. Ans. D is incorrect as Tcold will be the same as other loops and backflow will be occurring.

**Technical References:** OFN BB-005,RCP Malfunctions; ALR 00-066B, Loop 1  $\Delta T$  LO DEV

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300300 Obj. 8

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Loss of one RCP can cause confusion if the operators cannot interpret plant response and act accordingly.

**Question Worksheet Common #34**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	004 K4.15	
	Importance	3.0	3.4

**Proposed Question:**

Which of the following conditions would PREVENT opening BG-8149A, Letdown Orifice Isolation?

- A. Orifice Isolation valves BG-8149B and BG-8149C are already open.
- B. Containment Isolation valve, BG-8152 is closed.
- C. Letdown Isolation valve BG-459 or BG-460 is closed.
- D. Letdown heat exchanger pressure is less than 300 psig.

**Proposed Answer:** C, Letdown Isolation valve BG-459 or BG-460 is closed.

**Explanation:** Ans. A is incorrect as all letdown valves can be open at one time and are open during cooldown. Ans. B is incorrect as no interlock exists with this valve except for Phase A. Ans. C is correct and provides an interlock to prevent flashing in the Regen. Hx. As. D is incorrect as this pressure may be varied as plant conditions warrant.

**Technical References:** M-12BG01, E-13BG35

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300400, Obj.3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Knowledge of interlocks and reasons helps the operator confirm proper plant operations and also prevents mis-operation.

**Question Worksheet Common #35**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	013 K1.05	
	Importance	3.8	4.1

**Proposed Question:**

Which one of the following Engineered Safety Feature Actuation Signals (ESFAS) energizes to actuate?

- A. Steamline low pressure SI
- B. Containment pressure - Hi 2
- C. Automatic switchover to containment sump
- D. Containment pressure - Hi 3

**Proposed Answer:** D, Containment pressure - Hi 3

**Explanation:** Most ESFAS actuation signals are de-energized to actuate except for the containment spray signal. Inadvertent spray actuation is to be avoided and is considered worse than a failure of the signal to actuate when needed. Ans. A, B and C de-energize their respective bistable when required. Ans. D energizes it's bistable to actuate which is safer than the possibility of letting Containment Spray actuate on a loss of power.

**Technical References:** M-744-0025-05

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1302600 obj. 5

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (2-9)  
55.43

**Comments:** Tests understanding of ESFAS plant design.

**Question Worksheet Common #36**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	015 K6.03	
	Importance	2.6	3.0

**Proposed Question:**

The following plant conditions exist:

- Power level 30%, shutdown in progress.
- Power range N41 is out of service due to failed detector.

The plant trips due to a blown fuse on Power Range channel N42 causing a high flux trip.

Which of the following should occur as a result of this failure?

- A. The Intermediate Range will cause a second trip signal due to P-10.
- B. The Source Range will reset early and cause a Source Range high flux trip alarm.
- C. The Source Range block may be manually reset from the Main Control Board when power decreases below P-6, thus energizing Source Range instruments.
- D. The Source Range instruments must be manually energized at their respective cabinets.

**Proposed Answer:** D, The Source Range blocks will have to be manually energized at their respective cabinets.

**Explanation:** Ans. A is incorrect as P-10 will not clear due to the failure. Ans. B is incorrect as the source range will be incapable of being reset due to P-10. Ans. C is incorrect as a manual block reset will not work due to the P-10 failure. Ans. D is correct as no source range reset will occur from the MCB, Source Ranges will have to be manually energized..

**Technical References:** BD-OFN SB-008, Instrument Malfunctions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301501 Obj. 11

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators must know the effects of various failures on NI operation to prevent unnecessary plant trips.

### Question Worksheet Common #37

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier#	2	2
	Group #	1	1
	K/A #	017 K3.01	
	Importance	3.5	3.7

#### Proposed Question:

The plant has tripped and all Reactor Coolant Pumps (RCPs) have been stopped.

Twenty (20) minutes later the following conditions exist:

- Hot Leg Temperatures 620°F and increasing slowly
- Cold Leg Temperatures 560°F and decreasing slowly
- Pressurizer pressure 1800 psig and increasing slowly
- Steam Generator pressure 1010 psig and stable
- The Incore Thermocouple System is not in service

What is the status of Natural Circulation in the RCS?

- A. Exists as shown by Cold Leg Temperatures.
- B. Does not exist as shown by Hot Leg Temperatures.
- C. Exists as shown by Steam Generator pressure.
- D. Cannot be determined without Thermocouple indication.

**Proposed Answer:** B, Does not exist as shown by Hot Leg Temperatures.

**Explanation:** Ans. A is incorrect because Tcold is decaying without other indications which indicates stagnation. Tcold is also not at saturation for the given S/G pressure. Ans. B is correct as Thot is going up AND subcooling is less than 30 F. Ans. C is incorrect as the ARVs will attempt to maintain pressure in a narrow band and not at saturation for the given Tcold. Ans. D is incorrect as subcooling can be determined using RCS temperatures and pressures.

**Technical References:** EMG ES-04 Attachment B and BD EMG ES-04 page 59 and 60

**Proposed references to be provided to applicants during exam:** Steam Tables

**Learning Objective:** SY1301700 Obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators must be able to analyze plant conditions and determine if decay heat is being adequately removed by Natural Circulation.

### Question Worksheet Common #38

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	022 A1.03	
	Importance	3.4	3.1

**Proposed Question:**

The plant is at 100% power when you observe that containment humidity starts to increase.

Which one of the following leaks will cause a significant rise in containment humidity?

- A. CVCS Letdown Line
- B. CVCS Charging upstream of Regenerative Heat Exchanger
- C. Component Cooling Water Return Line
- D. Thermal Barrier Return Line

**Proposed Answer:** A, CVCS Letdown Line

**Explanation:** The only leaking system listed that will flash to steam is the CVCS Letdown Line. All other distractors/systems fluid remain in the liquid state.

**Technical References:** ALR 00-038A, LTDN REGEN TEMP HI

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300400, obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Operator should have knowledge of what possible sources will increase humidity in the containment.

**Question Worksheet Common #39**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	056 A2.04	
	Importance	2.6	2.8

**Proposed Question:**

The following conditions have occurred in the plant from 100% power.

- “A” Heater Drain Pump is tagged out for motor winding maintenance.
- Load was decreased to 80% to shutdown “C” Condensate pump due to high suction strainer  $\Delta P$ .

What parameter is monitored to increase power above 80%?

- A. Heater Drain System Flow
- B. Condenser Hotwell Level
- C. Main Feedwater Pump Suction Pressure
- D. Main Feedwater Temperature

**Proposed Answer:** C, Main Feedwater Pump Suction Pressure

**Explanation:** Ans. A, is plausible since one heater drain pump is removed from service, however this parameter is not the correct one. Ans. B is plausible since hotwell level will fluctuate, but the fluctuations will not be the concern for the power increase. Ans. C is correct since this parameter will limit how much of a power increase you can perform with limited pumps. Ans. D is a concern for reactor control, but is not a problem to restore power above 80%.

**Technical References:** ALR 00-107C, CNDS PMP SUCT STR  $\Delta P$  HI

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1505600 obj. 7

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (5)  
55.43 (5)

**Comments:** Automatic trip setpoints for major equipment is basic operator knowledge.



**Question Worksheet Common #40**

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

**Proposed Question:**

Which of the following conditions will trip a running Main Feedwater pump?

- A. Bearing oil header pressure of 3.8 psig.
- B. Suction pressure of 280 psig.
- C. Discharge pressure of 1750 psig.
- D. Turbine exhaust vacuum of 7.5" HgA.

**Proposed Answer:** A, Bearing oil header pressure of 3.8 psig.

**Explanation:** Ans. A is correct since a Low Bearing oil header pressure of < 4 psig will trip the pump. Ans. B is incorrect as this is an alarm, but will not cause a trip. Ans. C is incorrect since the setpoint is 1900 psig. Ans. D has a correct setpoint for the Main Turbine and not the Main Feed pump.

**Technical References:** WC RE-01 TPSD Plant Setpoint Document

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1505900 obj. 3 and 10

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators must know trips and setpoints for major plant equipment.

**Question Worksheet Common #41**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	061 K2.02	
	Importance	3.7	3.7

**Proposed Question:**

A plant fire has forced the evacuation of the control room using OFN RP-017, “CONTROL ROOM EVACUATION”. The plant is being controlled from the Auxiliary Shutdown Panel (ASP).

Which of the following conditions describes how these conditions will affect the starting of Auxiliary Feedwater Pump “B”?

- a) Can be started from the ASP
- b) Can be started locally at the breaker
- c) Automatically starts on Lo-Lo level in any one Steam Generator

- A. a and b
- B. a, b and c
- C. b only
- D. a only

**Proposed Answer:** C, b only

**Explanation:** When the ASP is manned, the Auxiliary Feedwater pumps are disconnected from any Automatic start signal. Handswitches for control of the AFW pumps are available at the ASP, however local operator actions de-energize control power to the emergency bus so only local control at the breaker will function.

**Technical References:** OFN RP-17, Control Room Evacuation

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1410001, obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Basic knowledge of MD AFW pump power supplies, and availability at the ASP.

**Question Worksheet Common #42**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	068 K1.07	
	Importance	2.7	2.9

**Proposed Question:**

Which of the following sources of Liquid Radwaste is processed via the Reactor Coolant Drain Tank subsystem?

- A. Containment building floor drains.
- B. Reactor Coolant Pump #2 seal leakoff.
- C. Normal RCS sample system returns.
- D. Inside Containment Safety Injection test lines.

**Proposed Answer:** B, Reactor Coolant Pump #2 seal leakoff.

**Explanation:** Ans. A goes to drain channel "B". Ans. B is correct. Ans. C goes to drain channel "A". Ans. D goes to RHUT and not the RCDT.

**Technical References:** M-12 HB01, M-12 BB03

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1406900 obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (2-9)  
55.43

**Comments:** Basic system knowledge

**Question Worksheet Common #43**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	068 K6.10	
	Importance	2.5	2.9

**Proposed Question:**

HB RV-18, Waste Monitor Tank “A” release isolation valve, for the Liquid Radwaste system received an automatic CLOSE signal.

Which one of the following could be the cause of this?

- A. Waste Monitor Tank Pump LOW FLOW
- B. TRIP of all Service Water Pumps
- C. Liquid Radwaste Monitor (HB RE-18) failed HIGH
- D. Secondary Liquid Radwaste Monitor (HF RE-45) failed HIGH

**Proposed Answer:** C, Liquid Radwaste Monitor (HB RE-18) failed HIGH

**Explanation:** Ans A. incorrect even though most radwaste system discharge paths isolate on Low Flow. Ans: B. incorrect, but may be confused with circ water pumps, which do give signal to isolate. Ans. C is correct. Ans D. incorrect but will isolate valves for only secondary liquid , not both.

**Technical References:** OFN SP-010, Accidental Radioactive Release.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1406900, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operator needs to know what will stop a liquid release.

**Question Worksheet Common #44**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	071 A2.09	
	Importance	3.0	3.5

**Proposed Question:**

The plant is stable in Mode 1 with all systems properly aligned in automatic.

Which one of the following component failures would require entry into OFN-SP-010, Accidental Radioactive Release?

- A. Waste Gas Decay tank #7 relief failed OPEN.
- B. Waste Gas Decay tank #8 relief failed OPEN.
- C. Waste Gas Compressor discharge relief failed OPEN.
- D. Volume Control Tank relief failed OPEN.

**Proposed Answer:** B, Waste Gas Decay tank #8 relief failed OPEN.

**Explanation:** Ans. A does not have a relief and is isolated at power. Ans. B is correct as all other tanks relieve to this tank and this tank would relieve to HVAC exhaust. Ans. C no such relief exists and the individual reliefs discharge to tank #8. Ans. D relieves liquid to the CVCS HUTs.

**Technical References:** M-12HA03, M-12BG03, OFN SP-010 Accidental Radioactive Release.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1407100 obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5)  
55.43 (5)

**Comments:** Question shows knowledge of normal system alignment and location of basic components within the system.

**Question Worksheet Common #45**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	072 A1.01	
	Importance	3.4	3.6

**Proposed Question:**

The plant has experienced a major Loss of Coolant Accident and is now aligned on Hot Leg Recirculation, per EMG ES-13, Transfer to Hot Leg Recirculation.

The plant chemist is drawing samples at the Primary Sample Sink when the radiation levels in that area increase to 4.5 E04 mr/hr.

The radiation level in the Residual Heat Removal (RHR) heat exchanger room is also 4.5 E04 mr/hr.

What will the radiation monitors indicate in the following rooms?

- PASS room (SD RE-47)
  - RHR room (SD RE-26)
- A. SD RE-47 and SD RE-26 will both be off scale high.
- B. SD RE-47 will read 4.5 E04 mr/hr and SD RE-26 will be off scale high.
- C. SD RE-47 and SD RE-26 will both read 4.5 E04 mr/hr.
- D. SD RE-47 will be off scale high and SD RE-26 will read 4.5 E04 mr/hr.

**Proposed Answer:** B, SD RE-47 will read 4.5 E04 mr/hr and SD RE-26 will be off scale high.

**Explanation:** The area monitors all peg high at 1E04 except for the PASS sample room which reads up to 1E05 R/hr. As a result, RE-26 will be off scale high and RE-47 will correctly indicate the current level of radiation. This makes B the correct answer.

**Technical References:** USAR 12.3, Table 12.3-2

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1407200 obj.4

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** The operator should understand this design consideration of the radiation monitors.

**Question Worksheet Common #46**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	072 A4.02	
	Importance	3.7	3.7

**Proposed Question:**

A Reactor Coolant System LOCA is in progress. Containment radiation levels are 110 R/HR.

Which of the following alarms will be generated by CHARMS on the Main Control Board?

- A. PROCESS RAD HI HI only
- B. PROCESS RAD HI HI and CTMT RAD HIGH
- C. AREA RAD HI HI only
- D. AREA RAD HI HI and CTMT RAD HIGH

**Proposed Answer:** B, PROCESS RAD HI HI and CTMT RAD HIGH

**Explanation:** Ans. A Incorrect - CHARMS is an area radiation monitor but inputs to the PROCESS RAD Hi Hi annunciator on reaching the 100 R/HR level. This is a plausible distracter because CHARMS also activates annunciator, CTMT RAD HIGH, if readings reach 100 R/hr. Ans. B Correct - CHARMS is an area radiation monitor but inputs to the PROCESS RAD HiHi and CTMT RAD HIGH annunciators on reaching the ALARM level. Ans. C Incorrect - CHARMS is an area radiation monitor but inputs to the PROCESS RAD HiHi annunciator on reaching the ALARM level. This is a plausible distracter because it alarms as a process monitor but is actually an area monitor and confusion can exist on which annunciator is activated. Ans. D Incorrect - CHARMS is an area radiation monitor but inputs to the PROCESS RAD HiHi annunciator on reaching the ALARM level. This is a plausible distracter since these are area monitors.

**Technical References:** ALR 00-061A, PROCESS RAD MON FAIL

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1407300 obj.3

**Question Source:** 1999 Wolf Creek Exam # 051 **Bank**

**Question History:** Wolf Creek (1999)

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** The candidate must recall that CHARMS is an area monitor that alarms as a process monitor.

**Question Worksheet Common #47**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	002 K3.02	
	Importance	4.2	4.5

**Proposed Question:**

The Plant is in Mode 6 and the following conditions exist:

- RCS Level (Loop 1) NR Cold Calibration (BB LI-53B/ BB LI-54B) reads 21 inches
- Reactor Vessel Head installed
- Maintenance has removed “A” crossover leg nozzle dam for repair due to leakage
- All other Nozzle Dams installed

A loss of all Residual Heat Removal (RHR) occurred and the crew enters OFN EJ-015, LOSS OF SHUTDOWN COOLING.

What is the effect on the fuel/core?

- A. *Any SI pump flow to the RCS would provide adequate core cooling.*
- B. A loss of reactor coolant through low pressure letdown to the VCT will result in uncovering the fuel.
- C. A pressure increase due to the heat up will push Reactor Coolant out the manway, uncovering the fuel.
- D. Boiling reduces RCS inventory and reflux cooling provided by S/G WR level will limit core uncovering.

**Proposed Answer:** C, A pressure increase due to the heat up will push Reactor Coolant out the manway, uncovering the fuel.

**Explanation:** Ans. A will occur but makeup is not the concern, the loss of vessel coolant from the manway and core uncovering is the problem. Ans. B will not lead to core uncovering as low pressure letdown requires RHR pump head to work. Ans. C is correct per the GEN 00-008 procedure. Ans. D is incorrect because the pathway to the S/G is blocked by the nozzle dams.

**Technical References:** GEN 00-008 caution prior to step 4.8.2

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732108, obj.3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** During reduced inventory conditions if a crossover leg opening exists, a loss of core cooling could result in core uncovering and damage. The speed with which this occurs depends on the amount of decay heat load and the RCS temperature at initiation of the event. Prompt operator action is necessary to prevent damage.



**Question Worksheet Common #48**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	006 K5.10	
	Importance	2.5	2.9

**Proposed Question:**

The unit has tripped from full power and a rapid cooldown has occurred along with a Loss of Coolant Accident. You have entered EMG FR-P1, Response to Imminent Pressurized Thermal Shock Conditions.

Should you start an RCP if possible and why?

- A. No, starting an RCP will cause pressure to spike in the RCS.
- B. No, running an RCP will increase the cooldown rate aggravating the thermal shock.
- C. Yes, running an RCP will provide normal spray flow and prevent thermal shock of the Aux Spray line.
- D. Yes, running an RCP will decrease the likelihood of a pressurized thermal shock condition.

**Proposed Answer:** D, Yes, running an RCP will decrease the likelihood of a pressurized thermal shock condition.

**Explanation:** Ans. A & B are incorrect since it is desirable to start an RCP and the effects given are not of the magnitude that will affect thermal shock conditions. Ans. C is incorrect since starting an RCP will not prevent the effects of thermal shock on the Aux Spray line and normal spray is not required by the time you get to this procedure. Ans. D is correct, since the RCP flow will prevent thermal shock in the system.

**Technical References:** BD EMG FR-P1 page 30 and procedure step 43

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732349, obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Knowledge of how to stop or limit flow propagation in the reactor vessel and what the potential causes are is needed to limit challenges to the vessel.

**Question Worksheet Common #49**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	006 A1.09	
	Importance	2.8	3.2

**Proposed Question:**

The plant is in Mid-loop to replace a Reactor Coolant Pump seal assembly when you start the "A" Residual Heat Removal pump.

10 seconds after starting the pump you note the current is still high and there is no flow indicated.

This indicates:

- A. Locked Rotor
- B. Closed Discharge Valve
- C. Pump Runout
- D. Low Flow Cavitation

**Proposed Answer:** A, Locked Rotor

**Explanation:** Ans. A is correct since this is the only option that would give you a high current reading along with a low flow. Ans. B & C would have low current indicated. Ans. D would indicate oscillating amps.

**Technical References:** ALR 00-049C,RHR Loop 1 Flow Lo; ALR 00-050A RHR Pump Trouble

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300500

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Operators are expected to observe pump parameters when starting a pump to look for various failures, such as a locked rotor.

**Question Worksheet Common #50**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	010 K4.01	
	Importance	2.7	2.9

**Proposed Question:**

The Pressurizer Spray valves are bypassed to allow for a small continuous amount of flow (1/2 gpm) for each spray line.

What is the purpose of this bypass flow?

- A. Equalizes boron between the Reactor Coolant System and Pressurizer.
- B. Reduces thermal shock when the spray valve is opened.
- C. Cools the Pressurizer to keep the backup heaters energized.
- D. Pressurizes Auxiliary spray lines to reduce pressure differential.

**Proposed Answer:** B, Reduces thermal shock when the spray valve is opened.

**Explanation:** Ans. A is incorrect as a set of backup heaters and subsequent main sprays perform the boron equalization function, not the 1/2 gallon bypass flow. Ans. B is correct, because this small amount of flow does keep the lines downstream of the spray valve warm. Ans. C is incorrect since this flow is not significant enough to keep the backup heaters energized. Ans. D incorrect, Auxiliary Spray has a discharge check valve that separates the systems.

**Technical References:** M-12 BB02

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY130100 Obj 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Question tests understanding of how normal system is aligned and reason for bypassing the spray valves.

**Question Worksheet Common #51**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	012 K2.01	
	Importance	3.3	3.7

**Proposed Question:**

The unit is stable at 8% power waiting for maintenance to be completed on the “A” Reactor Trip Breaker before increasing power. The “A” Reactor Trip Bypass Breaker is currently closed for this maintenance.

Power is subsequently lost to 120 VAC Instrument Bus NN01 (Red Train).

Which of the following actions will occur?

- A. A reactor trip signal will exist on reactor protection train “A” and the reactor will not trip.
- B. A reactor trip signal will exist on reactor protection train “B” and the reactor will not trip.
- C. The shunt coil on bypass breaker “A” energizes causing a reactor trip, “B” trip breaker is not affected.
- D. A Solid State Protection System cross trip causing the “B” trip breaker and the “A” bypass breaker opening causing a reactor trip.

**Proposed Answer:** D, A Solid State Protection System cross trip will cause the “B” trip breaker and the "A" bypass breaker to open.

**Explanation:** Ans. A is incorrect as the reactor will trip due to the “A” reactor protection signal tripping the “B” breaker. The bypass breakers allow rod drive power to be shunted around an open trip breaker for testing purposes. Therefore, the “B” bypass breaker is controlled by protection train “A” and the “A” bypass breaker is controlled by protection train “B”. Ans. B is incorrect as the reactor will trip. Ans. C is incorrect as a cross trip will cause the “B” trip breaker to open. Ans. D is correct due to loss of power to N35 IR channel causing a trip on the “B” channel and subsequent cross trip on “A” bypass breaker.

**Technical References:** OFN SB-008, Instrument Malfunctions, Attachment Q; BD-OFN SB-008, Background Document for Instrument Malfunctions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301200 obj.1 and 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A4

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators must understand the operation of the RPS in all alignment setups and all possible failure modes. This question discusses a loss of power with one RPS channel in test and the unit at power below P-10.

**Question Worksheet Common #52**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	012 A3.02	
	Importance	3.6	3.6

**Proposed Question:**

Given the following sequence of events:

- The Unit is at 100% power.
- NI 44 fails high.
- All applicable bistables are tripped per Technical Specifications requirements.
- Pressurizer Pressure Channel BB PT-456 fails low.

What would be the plant response?

- A. PORV Block Valve BB HV8000B would fail close.
- B. The reactor would trip on 2/4 OT  $\Delta$ T.
- C. The reactor would trip on 2/4 OP  $\Delta$ T.
- D. There is no effect unless BB PT-456 is selected.

**Proposed Answer:** B, The reactor would trip on 2/4 OT  $\Delta$ T.

**Explanation:** The OT  $\Delta$ T trip setpoint lowers as pressure drops below the 2235 psig. Therefore, if the pressure drops in one channel and the NI fails high on another a 2/4 coincidence occurs giving a trip. Ans. C is incorrect since OP  $\Delta$ T trip setpoint has no adjustment for  $\Delta$  flux, therefore the loss of NI would not affect the setpoint. Ans. A is incorrect because a single channel failure will not close the block valves. Ans. D is incorrect because the pressure channel can't be deselected from the Loop 2 OT $\Delta$ T trips.

**Technical References:** OFN SB-008 Attachment K&L

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301200 obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators are required to know how instrument deviations can affect bistable actuation.

**Question Worksheet Common #53**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	026 K3.02	
	Importance	4.2	4.3

**Proposed Question:**

The following conditions exist:

- A large loss of coolant accident has occurred.
- A Safety Injection (SIS), Containment Isolation (CIS), and Containment Spray Actuation (CSAS) signals have initiated.
- Refueling Water Storage Tank (RWST) level is 8% and decreasing.

Which one of the following signals must be RESET to swap over to Containment Sump Recirculation Phase?

- A. RWST LOLO Level
- B. CIS Phase "A"
- C. SIS
- D. CSAS

**Proposed Answer:** D, CSAS

**Explanation:** Ans A is incorrect since this really has no affect on the Containment Spray lineup, but will open the Containment Recirc Sump Suction for RHR suction. Ans. B is incorrect, since CISA is not required to be reset in order to open the Containment Recirculation valves even though CISA does close the valves. Ans. C is incorrect, since SIS does not send a signal to the Containment Spray Recirc Sump Valves, but an SIS along with the RWST LOLO level will automatically open the Recirc Sump valves for the RHR pumps. Ans. D is correct since the CSAS must be reset in order to close the RWST suction valves to the Containment spray pumps.

**Technical References:** Drawings M-12BN01, M-12EJ01, M12EN01

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1302600, obj.5

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Need to know requirements of actions prior to taking manual operation of a system.

**Question Worksheet Common #54**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	029 K4.03	
	Importance	3.2	3.5

**Proposed Question:**

Containment Mini Purge is in service prior to a containment entry at the beginning of a refueling.

GT RE-31, Containment Atmosphere radiation monitor goes into HI-HI alarm with the other containment monitors rapidly increasing.

Which one of the following automatic actions will occur?

- A. Fuel/Aux Building Emergency Exhaust Fans START.
- B. Containment Shutdown Purge Fans START.
- C. Containment Mini Purge System will ISOLATE.
- D. Containment Isolation Signal Phase “A” ISOLATES Purge.

**Proposed Answer:** C, Containment Mini Purge System will ISOLATE

**Explanation:** Ans. A is possible because just about every other actuation signal starts these fans, but CPIS does not. Ans. B, Containment Purge fans may seem like a good idea to help clean up the containment atmosphere, but they stop and are isolated on CPIS. Ans. C. is correct as CPIS will isolate all and any containment purge. Ans. D, incorrect even though it will isolate purge, a high area radiation signal will not initiate a CIS phase “A”.

**Technical References:** OFN-SP-010, Accidental Radioactive Release, SYS GT-120 Containment Mini Purge System Operations

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1302800 obj. 7

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Understanding of what occurs given a Containment Purge Isolation Actuation Signal.

## Question Worksheet Common #55

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	035 K6.02	
	Importance	3.1	3.5

### Proposed Question:

The reactor has just tripped from 100% power and the Main Steamline Isolation valves have been closed. The Atmospheric Relief Valve on the "B" Steam Generator (S/G) Main Steamline has failed and will not open regardless of controller position or S/G pressure.

How will this affect the subsequent cooldown?

- A. The safety valve on the "B" S/G Main Steamline will lift to limit pressure in the "B" S/G.
- B. A plant cooldown is limited to 50 °F/hr because only three S/G ARVs would be available.
- C. A plant cooldown could still be done, but the pressure change in "B" S/G would lag the other S/Gs.
- D. The Main Steamline Isolation valves would have to be opened before attempting a cooldown to prevent an SI signal.

**Proposed Answer:** C, A plant cooldown could still be done, but the pressure change in "B" S/G would lag the other S/Gs.

**Explanation:** Ans. A is incorrect as the pressure is controlled by Tavg and would not get to the safety valve as other ARVs would work. Ans. B is incorrect since one ARV will permit a 50°F/hr cooldown so three would allow a rate up to 150°F/hr. Ans. C is correct as the pressure in "B" S/G would be slow to react during the cooldown. Ans. D is incorrect as one S/G pressure higher than the others will not cause an SI signal.

**Technical References:** EMG FR-H4, Response to Loss of Normal Steam Release Capabilities

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1503900 Obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators need to know how the plant cooldown will be affected given abnormalities in the heat removal systems.



**Question Worksheet Common #56**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	039 K3.04	
	Importance	2.5	2.6

**Proposed Question:**

The unit is stable at 100% power with all systems properly aligned in automatic when the sensor line to AB PT-507, Steam Header Pressure transmitter breaks.

How will this affect the Steam Generator Water Level Control System (SGWLCS)?

- A. Steam generator level will increase and then restore to the normal 50% level setpoint.
- B. Steam generator level will decrease and stabilize at a level below 50% narrow range.
- C. The feedwater pump speed will decrease to attempt to match the actual measured delta P to program.
- D. The feedwater pump speed will increase to attempt to restore proper differential pressure.

**Proposed Answer:** C, The feedwater pump speed will decrease to attempt to match the actual measured delta P to program.

**Explanation:** Ans. A is incorrect since level will initially trend down not up as stated. Ans. B is incorrect as level will restore to 50% if enough feed flow is available, but FWIVs will open to maintain levels. Ans. C is correct since the header pressure failure will cause a reduction in speed due to the reduction in  $\Delta P$  across the S/G due to the failed instrument. Ans. D is incorrect since this failure will cause the sensed  $\Delta P$  across the S/G to decrease causing the pump to slow down.

**Technical References:** OFN SB-008, Instrument Malfunctions, Attachment B

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1505902 obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operator must determine from indications how the failure will affect the control system so that the operator can take proper manual control to stabilize the plant.

**Question Worksheet Common #57**

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

**Proposed Question:**

The unit is stable at 100% power when a S/G tube rupture occurs.

Which of the following radiation monitors would be the first to indicate the tube rupture?

- A. SJ RE-02, S/G Blowdown Sample Radiation Monitor
- B. GT RE-21A, Unit Vent Effluent Radiation Monitor
- C. SJ RE-25, S/G Blowdown radiation Monitor
- D. GE RE-92, Condenser Air Discharge Radiation Monitor

**Proposed Answer:** D, GE RE-92, Condenser Air Discharge Radiation Monitor

**Explanation:** All of the listed radiation monitors would be in a process flow stream for a S/G tube leak but GE RE-92 would be the first to indicate as it measures condenser off gas which concentrates the activity.

**Technical References:** USAR 11.5, 9.4

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1407300 obj. 9

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (4)  
55.43

**Comments:** Operator knowledge of primary and B/U indications for a SGTR are expected memory items.

**Question Worksheet Common #58**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	063 A3.01	
	Importance	2.7	3.1

**Proposed Question:**

Battery Charger NK21 has failed and Swing Battery Charger NK25 is now in service.

How would the operator in the control room be alerted if the AC power supply breaker for NK25 Battery Charger tripped?

- A. ALR 00-025C, NK01 Trouble alarm would annunciate.
- B. ALR 00-30F, SWNG CHG NK25 IN SERV alarm would clear.
- C. Voltage on DC bus NK01 would step decrease at least 20 volts.
- D. Amperage on DC bus NK01 would increase significantly.

**Proposed Answer:** A, ALR 00-025C, NK01 Trouble alarm would annunciate.

**Explanation:** The annunciators are automatically shifted to the swing charger when it is placed in service. Ans. B occurs when the swing charger is placed in service and would not clear. Ans. C is incorrect as voltage would not be immediately affected. Ans. D would not occur as load has not been added to the bus and voltage has not decreased yet.

**Technical References:** ALR 301, 125 VDC Class IE Switchboard NK01

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1506300, obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** The operator must understand how the system is configured and how a loss of a battery charger affects the system to answer the question correctly.

**Question Worksheet Common #59**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	063 A4.03	
	Importance	3.0	3.1

**Proposed Question:**

Following a Loss of All AC power, what criteria are used to determine what DC loads to de-energize?

- A. Individual DC bus voltages
- B. Individual DC bus amperages
- C. Battery discharge rates
- D. Availability of alternate chargers

**Proposed Answer:** A, Individual DC bus voltages

**Explanation:** Ans. A is correct since EMG C-0 uses bus voltage to determine when to shed additional loads. Ans. B will provide useful information on existing load but is not the criteria. Ans. C is not an available indication in the Control Room. Ans. D incorrect, but may be chosen if some AC power is still available to the chargers.

**Technical References:** EMG C-0 step 26 and Attachment C

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1506300 obj.1 and 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operator should know what parameters to monitor when assessing batteries.

**Question Worksheet Common #60**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	064 A1.01	
	Importance	3.0	3.1

**Proposed Question:**

You are running Emergency Diesel Generator NE01 for a surveillance test.

Which of the following conditions would indicate a failure of the “power pill” in the Temperature Control Valve for the Diesel Generator Lube Oil Heat Exchanger?

- A. Lube Oil pressure would increase.
- B. Lube Oil pressure would decrease.
- C. Lube Oil temperature would decrease.
- D. Lube Oil temperature would increase.

**Proposed Answer:** D, Lube Oil temperature would increase.

**Explanation:** Ans. A and B are incorrect pressure would not be affected. Ans. C is incorrect since power pill failure causes cooling water flow to bypass the heat exchanger and thus increasing lube oil temperature. A common misconception is that the power fails to allow more cooling not less. Ans. D is correct as stated previously.

**Technical References:** ALR 501-02E, Standby Diesel Engine System Control Panel KJ-121

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1406400 obj. 9

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Operator should know what will cause improper indications on the DG.

**Question Worksheet Common #61**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	079 A2.01	
	Importance	2.9	3.2

**Proposed Question:**

An air leak has resulted in an automatic isolation of the service air header. The Control Room has entered ALR 00-092A, COMPRESS AIR PRESS LO.

To restore the service air header to operation following repair, the operator will:

- A. Manually open KA PV-11.
- B. Open the service air header KA PV-11 bypass valve and allow KA PV-11 to automatically open.
- C. Open the service air header KA PV-11 bypass valve and then manually open KA PV-11.
- D. Start an additional air compressor to raise pressure > 120 psig allowing KA PV-11 to modulate open automatically.

**Proposed Answer:** B, Open the service air header PV-11 bypass valve and allow KA PV-11 to automatically open.

**Explanation:** Ans. A is incorrect since this valve opens automatically when air pressure is equalized across the valve.. Ans. B is correct since this is the proper operation of the valve. Ans. C is incorrect since the main valve will open automatically after the bypass has been opened and pressure equalized. Ans. D is incorrect since pressure still needs to be equalized across the valve.

**Technical References:** ALR 00-092A, Compress Air Press Lo

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1407800

**Question Source:** 1999 Wolf Creek Exam # 066 Bank

**Question History:** Wolf Creek (07/1999)

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5)  
55.43 (5)

**Comments:** Operator needs to know how to restore the service air system.

**Question Worksheet Common #62**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	086 K5.04	
	Importance	3.1	3.4

**Proposed Question:**

Given the following plant conditions:

- A fire is occurring on the 2000' of the control building in the NB switchgear room.
- Automatic fire suppression has actuated.

Which one of the following states the method of fire protection in the affected equipment room and hazard to personnel?

- A. Halon flood causing a chemical burn hazard.
- B. Halon flood causing a respiratory hazard.
- C. Wet pipe sprinkler system causing a shock hazard.
- D. Water deluge system causing a flood hazard.

**Proposed Answer:** B, Halon flood causing a respiratory hazard.

**Explanation:** Ans. A is incorrect because when Halon gas comes into contact with your skin, it will not burn. Ans. B is correct, since inhaling Halon will cause a respiratory hazard. Ans. C & D are incorrect, since this type of fire protection system is not installed in the switchgear rooms.

**Technical References:** MSDS for Halon 1301

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1408600 obj. 2

**Question Source:** INPO EXAM BANK # 1464 Modified

**Question History:** Palo Verde (03/24/97)

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Knowledge of normal power supplies and automatic features associated with the fire suppression system are required to answer this question.

**Question Worksheet Common #63**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	086 A3.03	
	Importance	2.9	3.3

**Proposed Question:**

Which one of the following systems automatically actuates and suppresses a fire located in Diesel Generator “A” room?

- A. Pre-Action Sprinkler System
- B. Wet Pipe Sprinkler System
- C. Carbon Dioxide Spray System
- D. Halon 1301 Spray System

**Proposed Answer:** A, Pre-Action Sprinkler System

**Explanation:** All fire alarms actuate on KC-008, Fire Protection Main Control Panel. Ans. A is correct as a Pre-Action system is used in the Diesel Rooms since this type of system will not discharge water in the event of an inadvertent actuation. Ans. C is incorrect, since Wet Pipe systems are not used in applications where and inadvertent actuation would cause vital equipment damage, the pipe is always full of water. Answer C is incorrect since CO2 is only used in a portable fire extinguisher, not a permanently installed system. Ans. D is used in electrical and communications rooms throughout the site, but is not used in this application.

**Technical References:** USAR 9.5 B.7

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1408600 obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators should know the systems that will automatically actuate to suppress fires in different areas throughout the plant.



## Question Worksheet Common #64

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A #	007 K3.01	
	Importance	3.3	3.6

### Proposed Question:

Which of the following will cause the largest increase in containment pressure assuming that all systems work as designed?

- A. The turbine trips from full power with a delayed reactor trip.
- B. One pressurizer power operated relief valve lifts and fails to reseal.
- C. One pressurizer code safety valve lifts and fails to reseal.
- D. The Letdown Relief Valve, BG V8117, lifts and fails to reseal.

**Proposed Answer:** C, One pressurizer code safety valve lifts and fails to reseal.

**Explanation:** Ans. A is part of PRT and PZR safety design. Ans. B is approximately 1/2 of the flow from a safety valve. Ans. C is correct due to the massive energy mass discharged to the PRT and then thru the rupture discs. Ans. D does lift at a high pressure and discharge to the PRT, but is not near the same capacity as the other components listed.

**Technical References:** USAR 5.4-50

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300200 obj. 3, 4

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Question tests operators understanding of system design and flow rates for various relief valves.

## Question Worksheet Common #65

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A #	008 A3.08	
	Importance	3.6	3.7

### Proposed Question:

Which of the following actions will occur automatically following a Loss of Coolant Accident when the automatic shift over to recirculation phase starts?

Component Cooling Water to the...

- A. Steam Generator Sample Coolers is initiated.
- B. Reactor Coolant Pumps is secured.
- C. Residual Heat Removal pumps is initiated.
- D. Spent Fuel Pool Heat Exchanger is secured.

**Proposed Answer:** D, Component Cooling Water to the Spent Fuel Pool Heat Exchangers is secured.

**Explanation:** Ans. A is manually initiated after SI signal is reset. Ans. B is done on a phase B isolation, not on auto swapper. Ans. C, RHR pumps are not lined up, heat exchangers are isolated on an SI signal. Ans. D is correct to limit heat loads to supply the RHR heat exchangers.

**Technical References:** E-13EC02, Schematic Diagram CCW Discharge Valves from Fuel Pool Cooling Heat Exchanger

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1400800 obj. 7

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Tests knowledge of automatic actions, which must be confirmed by the operator.

**Question Worksheet Common #66**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	3	2
	K/A #	028 K6.01	
	Importance	2.6	3.1

**Proposed Question:**

Following a Loss of Coolant Accident, which of the following conditions would result in a need to use the Containment Hydrogen Purge system?

- A. Both recombiners fail resulting in a hydrogen concentration of 3.2% increasing slowly.
- B. Any time one or both recombiners are placed into operation.
- C. The recombiners cannot be used because containment pressure remains above 4 psig.
- D. Both recombiners are operating hydrogen concentration 4.5% decreasing slowly.

**Proposed Answer:** A, Both recombiners fail resulting in a hydrogen concentration of 3.2% increasing slowly.

**Explanation:** Ans. A is correct, if both recombiners are not reducing hydrogen to less than 3%, Hydrogen Purge is needed. Ans. B. is incorrect as hydrogen purge is not needed unless the recombiners are not reducing the hydrogen concentration. Ans. C is incorrect as containment pressure is not a consideration. Ans. D is incorrect, because this shows the recombiners are working poorly, but have not failed and purge is not required.

**Technical References:** USAR 6.2.5.21

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1302800 obj. 5

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Hydrogen generation and control is a concern during a LOCA to prevent a hydrogen burn and resulting pressure spike.

**Question Worksheet Common #67**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A #	041 A2.03	
	Importance	3.6	3.9

**Proposed Question:**

Given the following conditions:

- Unit is operating at 20% full power.
- A rupture occurs on the Instrument Air header in Turbine Building.
- Instrument Air pressure is 68 psig and stable.
- OFN KA-19, Loss of Instrument Air, is in progress.

WHICH of the following actions should the crew perform?

- A. Trip reactor, stabilize using atmospheric relief valves.
- B. Trip reactor, stabilize using condenser steam dump valves.
- C. Trip main turbine, stabilize using condenser steam dump valves.
- D. Trip main turbine, stabilize using atmospheric relief valves.

**Proposed Answer:** A, Trip reactor, stabilize using atmospheric relief valves.

**Explanation:** Ans. B incorrect as the condenser steam dumps will not operate with this low of a pressure. Ans. C and D only trip the main turbine and would place the unit in a condition that would cause a reactor trip.

**Technical References:** OFN KA-19, Loss of Instrument Air

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732429

**Question Source:** INPO EXAM BANK # 13955 Bank

**Question History:** Palo Verde (11/18/96)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Operators should understand the problems associated with the condenser steam dumps with a loss of instrument air.

**Question Worksheet Common #68**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A #	045 K5.23	
	Importance	2.7	2.8

**Proposed Question:**

The plant is increasing power from 35% to full power. Unit load had been reduced two days ago for maintenance. Current RCS boron concentration is 630 ppm.

Which of the following should be done during the power increase?

- A. Use control rods to maintain T-avg greater than T-ref.
- B. Maintain the control rods at the "parked position" and use normal makeup to change power.
- C. Use rods and normal makeup to maintain T-avg within 1.5°F of T-ref.
- D. Allow rods to move automatically to follow turbine load without diluting.

**Proposed Answer:** C, Use rods and normal makeup to maintain T-avg within 1.5°F of T-ref.

**Explanation:** Ans. A is used when moderator temperature coefficient is positive, which it is not in this question. Ans. B is incorrect as the procedure uses rods for AFD and temp. control. Ans. C is correct since a combination of rods and borate/dilute will maintain AFD as well as power. Ans. D is incorrect since rods will be at their full out position prior reaching full power.

**Technical References:** GEN 00-004 page 12 through 14

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO4710205

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Reactivity management and the uses of control rods/boron in making power changes is important. The operator should know when to use rods to manage positive MTC and how to use rods when this is not a concern.

## Question Worksheet Common # 69

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	2.1.30	
	Importance	3.9	3.4

### Proposed Question:

The plant has lost power to NB01 Bus and OFN KJ-032, Local Emergency Diesel Startup, is in progress.

The Operator started the Diesel Generator (D/G) at NE107, Diesel Control Panel, by breaking the glass on the Emergency Start Button. The D/G is currently at rated voltage and frequency.

The following conditions now exist:

- Breaker NB0111, D/G Output Breaker, OPEN
- Breaker NB0112, NB01 Bus Normal Feeder Breaker, OPEN
- Breaker NB0109, NB01 Bus Alternate Feeder Breaker , OPEN

Which one of the following must the Operator perform in order to energize the NB01 Bus?

- A. Place the synchroscope in service, verify phase match, and CLOSE D/G Output Breaker.
- B. Place KJ HS009, Master Transfer Switch, to LOCAL/MAN, then back to AUTO.
- C. Place KJ HS008, D/G Main Control Board Switch, to RESET, then push START.
- D. Place NB0111, D/G Output Breaker, Local Handswitch to the CLOSE position.

**Proposed Answer:** B, Place KJ HS009, Master Transfer Switch, to LOCAL/MAN, then back to AUTO.

**Explanation:** Since the operator started the D/G locally, all operations from the control room will not be available making Ans. A and C incorrect. Ans. D is incorrect since the output breaker can only be closed locally if the breaker is in Test. Ans. B is correct as this action will clear the anti-pumping relay and allow the breaker to close.

**Technical References:** OFN KJ-03, Local Emergency Diesel Startup

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1406401, obj.3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators must be able to know how to get the D/G breaker closed in an emergency using local control.

**Question Worksheet Common # 70**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	2.2.13	
	Importance	3.6	3.8

**Proposed Question:**

You are asked to prepare a change to a hanging Clearance Order, which will tag a component that was previously NOT tagged. One of the individuals signed on to the Clearance is not presently on-site.

Which of the following actions should be performed?

- A. The Shift Manager notifies the Job Lead(s) to stop all work.
- B. Contact the individual by telephone to obtain concurrence and mark the Clearance Change “per telecon.”
- C. The Shift Manager authorizes removal of the individual from the Clearance Order.
- D. Tags are added to the Clearance Order for the work in progress and work continues.

**Proposed Answer:** D, Tags are added to the Clearance Order for the work in progress and work continues.

**Explanation:** Ans. A is true but incorrect, because tags are being added, not removed. Ans. B is not true and incorrect because the new tagging system does not require individual concurrence and for the same reason as Ans. A. Ans. C is true but incorrect because tags may be added without worker concurrence. Ans. D is correct as tags can be added without concurrence.

**Technical References:** AP 21E-001, Clearance Orders, page 9, 12 and 15

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733205 obj 23

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (10)  
55.43

**Comments:** Operators must be able to understand and process clearance orders for the protection of all workers.

## Question Worksheet Common #71

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	2.2.33	
	Importance	2.5	2.9

### Proposed Question:

With all control banks fully inserted, Control Bank “A” was withdrawn 50 steps with the bank selector switch positioned to the CB “A” position.

The selector switch is now placed in “MANUAL” and rods are withdrawn.

At what Control Bank “A” rod height will Control Bank “B” start to move?

- A. 115 steps
- B. 113 steps
- C. 165 steps
- D. 163 steps

**Proposed Answer:** C, 165 steps

**Explanation:** When an individual bank is selected, the counting feature of the bank overlap unit is locked out. Ans. A is incorrect since the overlap will start at 115 steps beyond the initial pull of 50 steps. Ans. B is incorrect as stated in “A”, but could be picked due to the fact 113 steps is the number of steps which the rods move together. Ans. C is correct in that normal overlap plus the initial 50 step pull would be when Bank “B” would start moving. Ans. D is incorrect if the misconception of 113 steps is the overlap setpoint as stated in answer B.

**Technical References:** M763-0831 WESTINGHOUSE ROD CONTROL MANUAL

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300100 obj. 6

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (6)

**Comments:** Operators need to know indications based on the design of the rod programming module.



## Question Worksheet Common #72

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	2.3.2	
	Importance	2.5	2.9

### Proposed Question:

A Reactor Operator is performing a tagging audit in the field by verifying tags are hung on the proper components.

One of the tags found during the audit is found to be located inside a Locked High Radiation Area (LHRA).

Which of the following is an acceptable response to this situation?

- A. Contact the Shift Manager and document waiving verification of the tag due to ALARA concerns.
- B. Obtain a key from the control room and enter the LHRA to verify the component tag.
- C. Contact HP to send an HP technician to assist in entering the LHRA to verify the component tag.
- D. Disregard the tag and move on to the next item on the list, since this tag does not require verification.

**Proposed Answer:** A, Contact the Shift Manager and document waiving verification of the tag due to ALARA concerns.

**Explanation:** Ans. A is correct, since a review of tags physically located in High Radiation Areas is not required, but problems are documented on the Clearance Order Review form APF 21E-001-05. Ans. B and C are incorrect since this would not be in accordance with standard ALARA practices. Ans. D is incorrect, because the tag shall not be disregarded, but documented on the Clearance Order Review form APF 21E-001-05.

**Technical References:** AP 21E-001, Clearance Orders, step 6.11; AP 25A-401, ALARA Program.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733205, obj. 24; LO1733204, obj. 3

**Question Source:** INPO EXAM BANK # 13586 Modified

**Question History:** Palo Verde (12/07/98)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (12)  
55.43 (4)

**Comments:** Knowledge of the ALARA program and how it is properly implemented is a responsibility of all radiation workers during all operations.

**Question Worksheet Common #73**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	2.4.2	
	Importance	3.9	4.1

**Proposed Question:**

The reactor has tripped due to a Loss of Coolant Accident (LOCA) and all Vital and Non-vital AC and DC power is available. The crew is currently performing steps in procedure EMG E-0, Reactor Trip or Safety Injection.

Pressurizer Pressure is currently reading 1820 psig and dropping. Low Press SI Annunciator alarms.

The Reactor Operator notes that only the “A” Train components of Safety Injection (SI) are actuating.

Which of the following Operator actions are required?

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

**Proposed Answer:** D, Manually initiate a Safety Injection on the “B” Train from the Control Board.

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

**Technical References:** AP 15C-003, Procedure User’s Guide for Abnormal Plant Conditions, Attachment C.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733203

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operator must know and be able to implement the EOP rules and expectations to correctly answer this question.

## Question Worksheet Common #74

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	2.4.10	
	Importance	3.0	3.1

### Proposed Question:

The plant is in a tripped condition and the EMG's are in effect.

Operators promptly acknowledge annunciators but only announce...

- A. them if conditions permit.
- B. those that are significant.
- C. those that are expected.
- D. them during crew briefs.

**Proposed Answer:** B, those that are significant.

**Explanation:** Ans. A is incorrect as significant annunciators should be announced without delay. Ans. B is correct as specified in AP 15C-003. Ans. C is incorrect as you announce those that are unexpected. Ans. D is incorrect as it involves delay.

**Technical References:** AP 15C-003, Procedure User's Guide for Abnormal Plant Conditions page 10

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733201 obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (10)  
55.43 (5)

**Comments:** Use of annunciators during emergency conditions can improve or worsen a plant event. Appropriate use of annunciators is an aid to mitigation.

## Question Worksheet Common #75

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	2.4.23	
	Importance	2.8	3.8

### Proposed Question:

The following plant conditions exist:

- The plant has tripped
- An automatic Safety Injection actuation has occurred

You have completed the first four steps of EMG E-0, Reactor Trip or Safety Injection.

Which of the following conditions would be the FIRST to require you to transition out of EMG E-0, if the stated condition existed?

- Transition to EMG E-1, Loss of Reactor or Secondary Coolant if a PZR PORV is stuck open and the block valve will not close.
- Transition to EMG E-2, Faulted Steam Generator Isolation if any S/G pressure is decreasing in an uncontrolled manner.
- Transition to EMG FR-H1, Response to Loss of Secondary Heat Sink if total AFW flow is 200,000 LBM/HR and all S/G levels are 0% WR.
- Transition to EMG FR-C1, Response to Inadequate Core Cooling if the hottest core exit TC is 900°F and the RCS is 50 degrees subcooled.

**Proposed Answer:** C, Transition to EMG FR-H1, Response to Loss of Secondary Heat Sink if total AFW flow is 200,000 LBM/HR and all S/G levels are 0% WR.

**Explanation:** Ans. A is a transition at step 10 of E-0 and therefore incorrect. Ans. B is a transition at step 15 of E-0 and therefore not correct. Ans. C is a transition at step 7, the first opportunity to leave E-0. Ans. D is a CSFST transition step, but the given conditions do not put the safety function in jeopardy.

**Technical References:** EMG E-0 steps 1-20, EMG F-0 (Core Cooling)

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733203 obj. 13

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (10)  
55.43

**Comments:** Operators must know the priority of procedures especially during the initial phases of the event so that transitions are not missed.

**Question Worksheet RO #76**

<b>Examination Outline Cross-reference: Level</b>	<b>RO</b>	<b>SRO</b>
	Tier #	1
	Group #	1
	K/A #	000074 EA2.08
	Importance	3.8

**Proposed Question:**

The plant has had an event requiring entry into EMG FR-C1, RESPONSE TO INADEQUATE CORE COOLING. You are ordered to depressurize all intact Steam Generators at the maximum rate using steam dumps. Depressurization is stopped when Steam Generator pressures are less than 160 psig and Reactor Coolant System (RCS) Hot Leg temperature is less than 375 °F.

What is the effect on the RCS if the steam dumps are not closed at these values?

- A. Injection of accumulator nitrogen into the RCS.
- B. Excessive cooldown creating a Pressurized Thermal Shock.
- C. RHR injection flow into the RCS Cold Legs is inhibited.
- D. RWST inventory for Safety Injection reflood of RCS is lost.

**Proposed Answer:** A, Injection of accumulator nitrogen into the RCS.

**Explanation:** Ans. A is correct per the background document for step 14 of EMG FR-C1. Ans. B is incorrect but plausible since a max rate cooldown is being performed, but PTS is not a concern at this temp and pressure. Ans. C is incorrect but plausible since injection of nitrogen would inhibit circulation, however injection is not affected in this case. Ans. D is incorrect but plausible since reflood is desired, however continued depressurization will not cause loss of the RWST at this time.

**Technical References:** Background Document EMG FR-C1 step 14

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732341, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (5)  
55.43 (5)

**Comments:** Candidate must understand the effect of a cooldown on RCS saturation temperature and pressure and correlate this information to expected accumulator pressures when depressurization criteria are met.

**Question Worksheet RO #77**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	
	Group #		1
	K/A #	000074	2.4.21
	Importance	3.7	

**Proposed Question:**

The unit has tripped due to a Loss of Coolant Accident (LOCA). After entering EMG E-1, Loss of Reactor or Secondary Coolant, the crew transitioned to EMG FR-Z1, Response to High Containment Pressure, and completed the procedure.

The crew has returned to EMG E-1 and the following conditions now exist:

- All Reactor Coolant Pumps STOPPED
- Reactor Vessel Level Indicating System UNAVAILABLE
- Core Exit Temperatures 720°F
- Containment Pressures 30 psig
- Pressurizer Level 0%

Which procedure should the crew now perform based on the above conditions?

- A. Continue with EMG E-1, Loss of Reactor or Secondary Coolant.
- B. Transition to EMG FR-Z1, Response to High Containment Pressure.
- C. Transition to EMG FR-I2, Response to Low Pressurizer Level.
- D. Transition to EMG FR-C2, Response to Degraded Core Cooling.

**Proposed Answer:** D, Transition to EMG FR-C2, Response to Degraded Core Cooling.

**Explanation:** Entry conditions exist for FR-C2 Orange path procedure making Ans. A incorrect and Ans. D correct. Ans. B is incorrect because FR-Z1 has been completed and should not be redone even though entry conditions exist. Conditions also exist for entry into FR-I2 but it is a yellow path so is lower on the list than FR-C2 making Ans. C incorrect.

**Technical References:** EMG F-0, Critical Safety Function Status Trees, AP 15C-003, Procedure User's Guide for Abnormal Plant Conditions.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732338, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** A Reactor Operator should know how to work their way through the CSFSTs.

**Question Worksheet RO #78**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	
	Group #		1
	K/A #	000076	AA2.01
	Importance	2.7	

**Proposed Question:**

A Charging Pump (CCP) is placed into service and the Normally Running Charging Pump (NCP) is secured for preventive maintenance.

Letdown is increased to 120 gpm before charging is increased. BG TCV-129, Letdown Divert Valve, bypasses the demineralizers in response to this action.

How will SJ RE-01, Failed Fuel Monitor, be affected?

- A. SJ RE-01 will lose flow causing detected activity to decrease.
- B. Increased Letdown flow does not affect detected activity.
- C. Increased Letdown flow causes detected activity to rise due to N-16.
- D. SJ RE-01 will lose flow however activity is unaffected.

**Proposed Answer:** B, Increased Letdown flow does not affect detected activity.

**Explanation:** Ans. A and D are incorrect but plausible because sampling is upstream of the divert valve. Ans. C is incorrect because the system design removes the N-16 before the detector. Ans. B is correct in that RCS liquid will pass through SJ RE-01 after the delay pipe and upstream of the divert valve.

**Technical References:** M-12 BG02

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1407300, obj.2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** Examines knowledge of sources/locations of high RCS activity.

## Question Worksheet RO #79

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	
	Group #		2
	K/A #	001 AA2.03	
	Importance	4.2	

### Proposed Question:

With the Unit holding at 30% power the following events occur:

- Control rods are in automatic and are stepping out.
- Annunciator, TAVG/TREF LO, alarms.
- The Reactor Operator verifies T-avg is 5 °F above T-ref and increasing.

The Reactor Operator has placed the Rod Bank AUTO/MAN SEL switch in MAN position and the control rods continue stepping out.

Which ONE of the following describes the next OPERATOR ACTION to this situation?

- A. Commence boration using SYS BG-200, REACTOR MAKEUP CONTROL SYSTEM NORMAL OPERATION.
- B. Commence emergency boration using OFN BG-009, EMERGENCY BORATION.
- C. Place Rod Bank AUTO/MAN SEL switch to AUTO and then back to MAN and verify rod motion has stopped using OFN SF-011, ROD CONTROL MALFUNCTIONS.
- D. Trip the reactor and perform the actions of EMG E-0, REACTOR TRIP OR SAFETY INJECTION.

**Proposed Answer:** C, Place Rod Bank AUTO/MAN SEL switch to AUTO and then back to MAN and verify rod motion has stopped using OFN SF-011, ROD CONTROL MALFUNCTIONS.

**Explanation:** Ans. A, incorrect per the procedure, but possible due to attempting maintain Tav<sub>g</sub>.  
Ans. B incorrect per procedure, but possible if candidate believes all rod control is lost. Ans. C correct, since the procedure allows one more try prior to tripping the reactor. Ans. D incorrect as the NEXT Operator Action, but plausible if the candidate not familiar with procedure.

**Technical References:** OFN SF-011, Realignment of Dropped, Misaligned Rod(s) and Rod Control Malfunctions.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732421, obj. 3

**Question Source:** INPO EXAM BANK # 4404 Modified

**Question History:** Turkey Point (9/12/1997)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** Need to know ways of addressing positive reactivity addition during continuous rod withdrawal event.



**Question Worksheet RO #80**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	1	
	Group #	3	
	K/A #	065 AA2.07	
	Importance	2.8	

**Proposed Question:**

A break in the Instrument Air header occurs in the Turbine Building.

Investigation reveals that isolating the leak will shut off air to the Main Feedwater Regulating Valves, AE FV-510, AE FV-520, AE FV-530, and AE FV-540.

After the leak is isolated, how long could the unit remain at power?

- A. 2 Hours
- B. 4 Hours
- C. 8 Hours
- D. >8 Hours

**Proposed Answer:** D, >8 Hours

**Explanation:** Ans. A is incorrect because the N2 accumulator is sized for 4 hours at normal operation. Ans. B is incorrect since the accumulator is sized to allow operation for 4 hours, however the tank is kept aligned to the high pressure N2 supply header. Ans. C is incorrect since the ARV and Aux Feed Accumulators are sized for 8 hours of operation. Ans. D is correct because the accumulator is normally aligned to the high pressure N2 supply and would provide additional volume without operator action.

**Technical References:** OFN KA-019 note prior to step 3 and step 12, DWG. M12-KH01, CKL NT-120.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1505900 obj.5 & 9, SY1408200 obj. 15, SY1407800 obj. 2, 3, and 5

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** Tests understanding of components supplied by nitrogen backup and expected amount of time nitrogen will be available.

**Question Worksheet RO #81**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #		1
	K/A #	001 A3.06	
	Importance	3.9	

**Proposed Question:**

The unit is stable at 50% power with all systems in automatic when control rods start to move in.

Which of the following indications would confirm that the rod motion was correct?

- A. A step increase in turbine impulse pressure with no initial change in T-avg.
- B. A T-avg input instrument fails low with a constant turbine load.
- C. A Condenser Steam Dump is opened with a constant turbine load.
- D. A step decrease in turbine load with no initial change in T-avg.

**Proposed Answer:** D, A step decrease in turbine load with no initial change in T-avg

**Explanation:** Ans. A indicates a rod control problem with T-ref and rods should move out. Ans. B a T-avg is an auctioneered and there should be no rod motion. Ans. C is incorrect as T-ref remains constant, but T-ave will decrease causing rods to move out. Ans. D is correct showing a downpower mismatch causing rods to drive in with no initial change in T-avg.

**Technical References:** OFN MA-001, Load Rejection or Turbine Trip.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300100 Obj. 7

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators must monitor rod control and confirm that it is working as designed.

## Question Worksheet RO #82

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	004 A4.09	
	Importance	3.5	

### Proposed Question:

Plant conditions are as follows:

- 100% power
- No Load Reduction in progress
- All Equipment in normal lineup

Alarm 00-033B, PZR HI PRESS DEV, alarms on the Main Control Board.

Pressurizer (PZR) Pressure is 2295 psig and increasing. All attempts to use Pressurizer Master Controller, BB PK-455A, fail to reduce pressure.

You should:

- A. Ensure Power Operated Relief Valve, BB PCV-456, opens.
- B. Open PZR Auxiliary Spray Valve, BG HV-8145, to lower pressure.
- C. Place PZR Spray Valve, BB PK-455B, in Manual and open to lower pressure.
- D. Trip the reactor due to the High Pressurizer Pressure condition.

**Proposed Answer:** C, Place PZR Spray Valve BB-PK455B in Manual and open to lower pressure.

**Explanation:** Ans. A will happen if no further operator action is taken, but manual control is available. Ans. B is incorrect since no procedural guidance is given to use Auxiliary Spray given this condition. Ans. C is correct since the procedure follows this usage as well as normal operating practice. Ans. D is incorrect because High Pressure Trip Setpoint has not been challenged.

**Technical References:** ALR 00-033B, PZR HI PRESS DEV

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301000, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operator needs know when it is appropriate to place the spray valves in Manual.

**Question Worksheet RO #83**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #		1
	K/A #	013 A2.01	
	Importance	4.6	

**Proposed Question:**

The plant has experienced a large break RCS loss of coolant accident.

Which ONE of the following must be reset to allow opening KA HV-0029, Instrument Air Containment Isolation?

- A. Containment Isolation Signal Phase "A" (CISA)
- B. Containment Isolation Signal Phase "B" (CISB)
- C. Safety Injection Signal (SIS)
- D. Containment Spray Actuation Signal (CSAS)

**Proposed Answer:** A, Containment Isolation Signal Phase "A" (CISA)

**Explanation:** CISA is the signal that isolates this containment isolation valve. All other distracters send signals to numerous components, making them possible selections.

**Technical References:** EMG E-1, Loss of Reactor or Secondary Coolant, Step 9e.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301301, obj. 3

**Question Source:** INPO EXAM BANK # 1053 **Modified**

**Question History:** Callaway (2/24/1997)

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content** 55.41 (5)  
55.43 (5)

**Comments:** Operator can identify the ESFAS signals that actuate various components during an emergency.

## Question Worksheet RO #84

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	015 2.2.23	
	Importance	2.6	

### Proposed Question:

The plant is stable at 100% power when the annunciator ALR 00-078D, "IR CMP VOLT FAIL" alarms.

INC determines that the compensation voltage for channel N36, Intermediate Range Neutron Flux, has failed and anticipates two days to obtain parts and complete repairs. INC reminds you that even after repairs are complete, compensation voltage will not be set correctly until after the next plant shutdown.

How will this affect continued plant operations?

- A. N36 will be declared inoperable and the plant will have to be shutdown within the next 72 hours.
- B. N36 will be operable once INC completes repairs although compensation voltage will be incorrect.
- C. N36 will be declared inoperable until compensation voltage is correctly set but power operations can continue indefinitely.
- D. N36 will be operable once INC completes repairs and sets compensation voltage to maximum making N36 conservative.

**Proposed Answer:** C, N36 will be declared inoperable until compensation voltage is correctly set but power operations can continue indefinitely.

**Explanation:** Ans. A is incorrect as Intermediate Range Detectors are not required above P-10. Ans. B is incorrect because compensation voltage is part of operability. Ans. C is correct per Tech specs.. Ans. D is incorrect as it would make the channel overcompensated.

**Technical References:** T.S. 3.3.1 and Bases for Intermediate Range Nuclear Instrument System

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301501 obj. 5

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (2)

**Comments:** Shows knowledge of IR operation and relations to T.S. requirements.

## Question Worksheet RO #85

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	017	K5.01
	Importance	3.1	

### Proposed Question:

Which of the following conditions would indicate that core damage is imminent?

- A. Reactor Vessel Level Indicating System is 60% with 4 RCPs running.
- B. Reactor Vessel Level Indicating System is 45% during natural circulation.
- C. Two core exit thermocouples indicate 1250°F, all others indicate less than 1200°F.
- D. Six core exit thermocouples indicate 1202°F, all others reading less than 1200°F.

**Proposed Answer:** D, Six core exit thermocouples indicate 1202°F, all others reading less than 1200°F.

**Explanation:** Ans. A is incorrect and indicates a lack of decay heat removal but not core damage. Ans. B is incorrect and indicates a lack of decay heat removal capability but not core damage. Ans. C is incorrect and indicates two failed detectors, but not enough to verify fuel damage. Ans. D is correct since the bases shows that five or thermocouples indicating greater than 1200 degrees indicates that core damage is imminent.

**Technical References:** BD EMG F-0 page 26 - 28

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1301700 Obj. 4

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** The background documents for the EMGs discuss indications of impending core damage in great detail. Operators should understand these indications in order to prioritize actions to prevent the damage.

**Question Worksheet RO #86**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	059 A3.02	
	Importance	2.9	

**Proposed Question:**

The unit is stable at 50% power with all systems in automatic when the steam pressure input to the “A” Steam Generator steam flow signal slowly fails to atmospheric pressure indication.

What will happen to the “A” Steam Generator level after the plant has stabilized?  
(Assume no operator action is taken)

“A” Steam Generator level will...

- A. oscillate above and below 50%.
- B. stabilize above 50%.
- C. stabilize below 50%.
- D. stabilize at 50%.

**Proposed Answer:** D, “A” Steam Generator level will stabilize at 50%.

**Explanation:** The system is level dominant so once the transient is over level will return to 50% (program) and stabilize due to the level error integrator. This is answer D. Ans. A is incorrect as no long term oscillation will occur. Ans. B and C are incorrect as flow error will eventually be overridden by the level error signal to obtain zero total error at 50% level.

**Technical References:** OFN SB-008, Instrument Malfunctions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1505902 Obj. 2 and 4

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators must understand the inputs to FW Control and the effects of failures on these inputs to correctly diagnose failures that affect programmed level.

**Question Worksheet RO #87**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	061	K5.03
	Importance	2.6	

**Proposed Question:**

The manual recirculation isolation valve for the "A" Motor Driven Auxiliary Feedwater (AFW) pump is inadvertently closed following surveillance testing. The next day, the unit trips from 100% power and all AFW pumps start and supply feed to the Steam Generators (S/Gs).

What will be the effect on the "A" Motor Driven AFW pump once level is restored and the discharge valves are isolated?

- A. The pump will cavitate causing damage to the pump impeller.
- B. The pump may overheat due to no flow causing damage to the pump components.
- C. The pump will heat up and increase the discharge pressure until the relief valve lifts.
- D. The pump discharge pressure will increase until the pump trips on high pressure.

**Proposed Answer:** B, The pump may overheat due to no flow causing damage to the pump components.

**Explanation:** Ans. A. is incorrect since cavitation is a function of low suction head and this is not the case. Ans. B is correct, because this is what happens during extended operations with a pump operating at maximum shutoff head, some flow is required to cool the pump. Ans. C is incorrect as no relief valve exists. Ans. D is incorrect as no such trip exists for this component.

**Technical References:** M-12 AL01, P&ID Auxiliary Feedwater System

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1406100 obj. 3, 7

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (5)  
55.43

**Comments:** Requires fundamental understanding of shutoff head.



**Question Worksheet RO#88**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	071 2.1.27	
	Importance	2.8	

**Proposed Question:**

Which of the following is a function of the Waste Gas System (HA)?

- A. Separate different waste gas types to prevent explosive mixtures.
- B. Prevent the release of radioactive gases to the public.
- C. Provide for storage of radioactive gases to completely decay.
- D. Control the release of gases to the environment.

**Proposed Answer:** D, Control the release of gases to the environment.

**Explanation:** Ans. A, is incorrect as the Waste Gas system does not separate gas types, but does store gases to allow decay prior to release. Ans. B is incorrect as the system does not prevent release, but controls it to minimize the impact on the public. Ans. C is incorrect as gases that are released are still decaying and will for generations to come, in some cases. Ans. D is correct in that the releases are controlled and not continuously being vented.

**Technical References:** USAR 11.3

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1407100 obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Question demonstrates basic understanding of the purpose and function of the Waste Gas system.

**Question Worksheet RO #89**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	026 2.1.2	
	Importance	3.0	

**Proposed Question:**

The unit has just tripped due to a LOCA and all Emergency Safety Function (ESF) equipment has started as expected.

You notice that alarm 048A, SPRAY PUMP TROUBLE has annunciated but both Spray pumps are still running.

You check both Spray Pump's running current on the NPIS computer and determine that the "A" Spray pump current is about 15% higher than the "B" Spray pump and Containment pressure is still greater than 30 psig.

You, as the Reactor Operator, should take which of the following actions?

- A. Immediately trip the "A" Spray pump as it should have tripped on overcurrent.
- B. Inform the Shift Manager and only trip the pump with their approval.
- C. Trip the "A" Spray pump as soon as Containment Pressure decreases to 26 psig.
- D. If all Containment Fan Coolers are operating, immediately trip the "A" Containment Spray pump.

**Proposed Answer:** B, Inform the Shift Manager and only trip the pump with their approval.

**Explanation:** The alarm actuates at 115% of normal current, but does not cause a pump trip. Justification is you do not secure ECCS equipment without Shift Manager approval in this case. Therefore, Ans. A is incorrect as it should not have tripped on overcurrent. Ans. B is correct since the pump should be tripped at the discretion of the Shift Manager. Ans. C & D may seem reasonable for the current conditions, but tripping the Spray pump still needs to have Shift Manager approval and there is no procedural guidance to support either one.

**Technical References:** ALR 00-048A Caution.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1302600 obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (10)  
55.43

Comments: This question tests whether the operator is allowed to shutdown vital equipment during an ESF actuation without direction from shift management.

**Question Worksheet RO #90**

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

**Proposed Question:**

The unit has just entered Mode 3 due to a tube leak on the “A” Steam Generator (S/G) and you are isolating the Steam Generator (S/G) using OFN BB-07A, Steam Generator Tube Leakage.

While performing the procedure you are unable to isolate the Main Steam Isolation Valves on the “A” Steam Generator (S/G).

Which of the following actions are required?

- A. Close All Main Steam Line Isolation, Bypass and Drain valves on the intact Steam Generators.
- B. Actuate a Main Steam Line Isolation Signal from the Main Control Board.
- C. Fill the “A” Steam Generator to 80% to 90% to reduce the radiation release.
- D. Open “A” Steam Generator Atmospheric Relief Valve to initiate a cooldown.

**Proposed Answer:** A, Close Main steamline, bypass and drain valves on the intact Steam Generators.

**Explanation:** The main idea of this question is to ensure the intact steam generators are isolated if the faulted steam generator cannot be isolated in order to prevent cross contamination. Ans. A is correct, since isolating the intact steam generators is the procedurally correct thing to do. Ans. B is incorrect, since we are in procedure OFN BB-07A and Mode 3, so an orderly shutdown is occurring. Also, MSLI is not even listed in this procedure though one may think it would be a useful method of getting the main steam isolations closed. Ans. C is incorrect, but may be picked since filling a ruptured S/G may reduce dose, but procedurally this is listed as 40-60%. Ans. D is incorrect since the procedure has you isolate ARVs vs. opening them to prevent a radioactive release to atmosphere, but a cooldown is required by other means.

**Technical References:** OFN BB-07A step 14

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1503900 obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operator knowledge of how to bottle up a S/G is tested in this question.

**Question Worksheet RO #91**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
		Tier #	2
		Group #	2
		K/A #	062 K2.01
		Importance	3.3

**Proposed Question:**

You have just lost power to 13.8 KV bus SL-3.

Which of the following loads de-energized as a result?

- A. Electric Driven Fire Pump
- B. Service Water Low Flow Pump
- C. Circulating Water Pump “C”
- D. Service Water Pump “A”

**Proposed Answer:** A, Electric Driven Fire Pump

**Explanation:** Ans. B, C and D are powered from SL-4. Ans. A is powered from SL-3 via 13.8/4.16 transformer to SL-31.

**Technical References:** **KD-7496, One Line Electrical Diagram**

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1506201 obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Required operator knowledge item.

## Question Worksheet RO #92

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	034 A4.01	
	Importance	3.3	

### Proposed Question:

The plant is in Mode 6 in the process of off-loading fuel when the following occurs:

- 00-61A, PROCESS RAD HI HI, in alarm
- Fuel Building Isolation Signal (FBIS)
- Control Room Ventilation Isolation Signal (CRVIS)

These actuations can be validated on the RM-11 (SP056A) by:

- A. GK RE-5 is RED
- B. GG RE-27 is RED
- C. GK RE-5 and GG RE-28 are YELLOW
- D. GG RE-27 and GG RE-28 are YELLOW

**Proposed Answer:** B, GG RE-27 is RED

**Explanation:** Ans. A is incorrect since this monitor will actuate a CRVIS, but not a FBIS. Ans. B is correct in that this monitor will actuate a FBIS and cross trip to a CRVIS. Ans. C and D will not cause an actuation and will cause an alarm only, but could be plausible if the operator believes any alarm will cause the actuation.

**Technical References:** ALR 00-61A, PROCESS RAD HIHI; OFN SP-010, Accidental Radioactive Release

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1407300 obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Operators are required to confirm automatic actions that occur following rad. monitor alarms during refueling as well as during all other phases of plant operations.

### Question Worksheet RO #93

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	076	K4.01
	Importance	2.5	

#### Proposed Question:

A Loss of Off Site power has occurred, current plant conditions are:

- The plant is in Mode 4
- Residual Heat Removal (RHR) cooldown in progress at maximum rate.

What will happen to the Essential Service Water (ESW) Isolation Valves for the Component Cooling Water (CCW) Heat Exchangers?

- A. EF HV-59 and 60, CCW Heat Exchanger Outlet Valves will OPEN.
- B. EF HV-59 and 60, CCW Heat Exchanger Outlet Valves will CLOSE.
- C. EF HV-51 and 52, CCW Heat Exchanger Inlet Valves will THROTTLE.
- D. EF HV-51 and 52, CCW Heat Exchanger Inlet Valves will CLOSE.

**Proposed Answer:** B, EF HV-59 and 60, CCW Heat Exchanger Outlet Valves will CLOSE.

**Explanation:** Ans. A is backwards as the valves will close. Ans. B is correct since these valves close on a SIS or Loss of Offsite Power. Ans. C and D are incorrect as the valves listed open, but do not throttle on the loss of power.

**Technical References:** M-12 EF02, P&ID Essential Service Water

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1408900 obj. 5

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (7)  
55.43

**Comments:** Tests fundamental knowledge of ESW operation during blackout/SI conditions.

**Question Worksheet RO #94**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	103	K1.02
	Importance	3.9	

**Proposed Question:**

Which ONE of the following conditions would affect Containment closure?

- A. Steam Generator on recirc. and a main steam safety valve removed.
- B. Inner escape hatch door is inoperable.
- C. Equipment hatch installed with 2 bolts holding it in place.
- D. Nitrogen pressure is at 35 psig to the electrical penetrations.

**Proposed Answer:** C, Equipment hatch installed with 2 bolts holding it in place.

**Explanation:** Ans. A is incorrect since the Steam Generators are full during recirc and removing safeties would not remove affect containment closure. Ans. B is incorrect, since it takes two escape hatch doors inoperable to affect containment closure. Ans. C is correct, because 4 bolts are required to maintain containment closure. Ans. D is incorrect since this only a boot and not the seal therefore less than 35 psig does not affect the seal and containment closure.

**Technical References:** Tech Spec. 3.9.4 and it's basis. STS GP-006, CTMT Closure Verification. GEN 00-008, Reduced Inventory Operations.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732108

**Question Source:** INPO EXAM BANK # 5912 Modified

**Question History:** Davis Besse (09/13/1999)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (2-9)  
55.43

**Comments:** Operator needs to know what affects containment closure.

**Question Worksheet RO #95**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.1.19	
	Importance	3.0	

**Proposed Question:**

Which of the following conditions will allow you to use the plant computer to monitor the Critical Safety Function Status Trees (CSFSTs) after entering the Emergency Operating Procedures?

- A. The computer agrees with the results of manual monitoring of the CSFSTs.
- B. The Shift Engineer is not available to monitor the CSFSTs manually.
- C. Only Yellow and Green paths are indicated and plant conditions are not changing rapidly.
- D. None of the CSFSTs indicate that an "invalid parameter" is associated with it.

**Proposed Answer:** A, The computer agrees with the results of manual monitoring of the CSFSTs.

**Explanation:** Ans. B is not a reason for computer monitoring of the Critical Safety Function Status Trees. Ans. A is correct as stated in AP 15C-003. Ans. C is a condition for relaxing the monitoring and not using the computer. Ans. D would allow you to continue to use the computer, but not initiate use of the computer.

**Technical References:** AP 15C-003 page 26, Procedure User's Guide for Abnormal Plant Conditions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733203 obj. 17

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43

**Comments:** Implementation of administrative procedure requirements during off normal/emergency conditions. Time to look up the requirement would not exist.



## Question Worksheet RO #96

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	2.1.23	
	Importance	3.9	

### Proposed Question:

Following a reactor trip you are told that a continuous action step applies.

Which of the following conditions would make that continuous action no longer applicable?

- A. You transition out of the procedure that ordered the continuous action to another EMG.
- B. You transition to a Functional Restoration procedure due to a Yellow path condition.
- C. A step in the current EMG procedure orders an action that would cancel the continuous action.
- D. Performing the step would cause you to violate a Technical Specification condition.

**Proposed Answer:** C, A step in the current EMG procedure orders an action that would cancel the continuous action.

**Explanation:** Ans. A is incorrect as the step continues to apply until canceled by another step. Ans. B is incorrect since it takes transition to a Red or Orange for the step to be canceled. Ans. C is correct as stated in the procedure user's guide. Ans. D is incorrect as performance of EMG steps takes precedence over T.S. unless indicated by the procedure, which would cancel the previous action (ans. C).

**Technical References:** AP 15C-003, Procedure User's Guide for Abnormal Plant Conditions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733203 obj. 15

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43

**Comments:** Tests knowledge of how to implement admin requirements under adverse conditions.

## Question Worksheet RO #97

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
		Tier #	3
		Group #	
		K/A #	2.2.2
		Importance	4.0

### Proposed Question:

Which of the following conditions would allow you to place Rod Control in manual when unexpected Automatic Rod Motion is in progress?

- A. You suspect the rod motion is due to an instrument or component malfunction.
- B. The rod motion is in progress and no rapid turbine load change is occurring.
- C. The rod motion is in progress and T-avg is within 1.0 °F of T-ref.
- D. The Reactor Operator feels that the rod motion should not be occurring.

**Proposed Answer:** B, The rod motion is in progress and no rapid turbine load change is occurring.

**Explanation:** Ans. A is incorrect as the failure may be reducing unit load and rod motion would be expected. Ans. B is correct as unexpected rod motion would indicate no temp. deviation and no valid auto signal is present. Ans. C is incorrect as the Power Mismatch circuit may be causing the rod motion. Ans. D is incorrect as the RO should not indiscriminately place rods in manual.

**Technical References:** AP 21-001 page 18, Operations Watchstanding Practices

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733212 obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43

**Comments:** Reactivity management and control is a primary concern of all licensed personnel. Knowing when to override Auto rod control and when not to, requires a comprehensive understanding of the Admin. requirements.

**Question Worksheet RO #98**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
		Tier #	3
		Group #	
		K/A #	2.3.4
		Importance	2.5

**Proposed Question:**

What radiation exposure limit requires written justification from the Group Supervisor AND the Manager Chemistry/Radiation Protection to exceed that limit?  
(i.e. no other authorizations are required.)

- A. 500 mrem/yr
- B. 1000 mrem/yr (site)
- C. 2000 mrem/yr (site)
- D. 4000 mrem/yr (total)

**Proposed Answer:** C, 2000 mrem/yr (site)

**Explanation:** Ans. A and B are incorrect as 500 mrem/yr and 1000 mrem/yr can be exceeded if annual dose is documented. Ans. D requires further approvals above what is required for 2000 mrem/yr limit. Ans. C is correct according to site imposed limits .

**Technical References:** AP 25A-001, Radiation Protection Manual, Attachment B

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733204 obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (4)

**Comments:** Basic radiation limits for the individual.

## Question Worksheet RO #99

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
		Tier #	3
		Group #	
		K/A #	2.3.9
		Importance	2.5

### Proposed Question:

You have been directed to operate the CTMT Mini Purge System to reduce pressure to a normal value.

Which of the following combinations of radiation monitors must be in operation and source checks completed prior to startup of this system.

- A. GT RT-22, CTMT purge exhaust high radiation AND GT RT-33, CTMT purge exhaust high radiation.
- B. GT RT-32, CTMT building high radiation AND GT RT-33, CTMT purge exhaust high radiation.
- C. GT RT-21A, Unit vent effluent radiation AND GT RT-22, CTMT purge exhaust high radiation.
- D. GT RT-32, CTMT building high radiation AND GT RT-21A Unit vent effluent radiation.

**Proposed Answer:** B GT RT-32, CTMT building high radiation AND GT RT-33, CTMT purge exhaust high radiation.

**Explanation:** Prior to starting the process of performing a containment mini-purge system, two rad monitors must be in service per the prerequisites in the procedure. The two that are needed are one purge exhaust and one building/atmosphere monitor. Therefore B is the only correct answer. A is plausible since listed are two exhaust monitors that monitor purge. C is a common misconception of the operators that the unit vent effluent monitor is required. D shows a building/atmosphere and an exhaust unit and shows misconception of the Unit vent effluent monitor causing actuation..

**Technical References:** SYS GT-120, Containment Mini Purge System Operations

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1302800 obj. 7, SY1407300, obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (4)

**Comments:** Process for initiating a containment mini-purge.

**Question Worksheet RO #100**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
		Tier #	3
		Group #	
		K/A #	2.3.11
		Importance	2.7

**Proposed Question:**

In accordance with the Wolf Creek Technical Specifications, when the specific activity of the primary coolant exceeds the Dose Equivalent I-131 limit, the plant must be in at least Hot Standby with T-avg less than 500 °F within 6 hours.

The temperature limit included in this Technical Specification Action Statement is specified to:

- A. Reduce the rate of the primary coolant-fuel reaction rate below that assumed in the Wolf Creek accident analyses.
- B. Reduce impact of iodine spiking following the rapid change in reactor thermal power.
- C. Minimize the degradation of the letdown demineralizers and maximize the efficiency of the reactor coolant clean-up.
- D. Minimize the release of activity should a steam generator tube rupture event occur.

**Proposed Answer:** D, Minimize the release of activity should a steam generator tube rupture event occur.

**Explanation:** The saturation pressure corresponding to 500°F is 680 psia, which is well below the setpoint of the S/G safeties. This point was chosen for the RCS specific activity Tech. Specs. to ensure radioactivity is not released to the public making Ans. D the only possible correct answer. Ans. A is incorrect because reducing temperature would actually increase the fuel reaction rate. Ans. B is incorrect since a temperature has no impact on Iodine Spiking. Ans. C is incorrect since a reduction in RCS temperature will have no effect on the efficiency of the demineralizers.

**Technical References:** Tech Spec 3.4.16 RCS Specific Activity and its associated bases.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732706, obj.1

**Question Source:** INPO EXAM BANK # 5382 Bank  
**Question History:** Salem (1/22/1996)

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43

**Comments:** Operators are required to know why temperature is kept low to prevent potential radioactive releases.

**Question Worksheet SRO #76 (101)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	011 EA2.06	
	Importance		4.0

**Proposed Question:**

The following conditions exist inside containment:

- Temperature = 228°F
- Pressure = 4 psig
- Humidity = 100%

Which of the following procedures would be used to verify the expected containment cooling system alignment?

- A. EMG E-0, Reactor Trip or Safety Injection
- B. EMG E-1, Loss of Reactor or Secondary Coolant
- C. EMG E-2, Faulted Steam Generator Isolation
- D. EMG ES-02, Reactor Trip Response

**Proposed Answer:** A, EMG E-0, Reactor Trip or Safety Injection

**Explanation:** The only place this information can be found is in E-0 all other answers would be incorrect. Answers B, C, and D are plausible distracters due to the possibility of a SIS occurring prior to entering any one of them.

**Technical References:** EMG E-0, Reactor Trip or Safety Injection, Attachment F

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1302600 obj. 9

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** Senior Reactor Operator must know when setpoints for Reactor Trip, ESFAS actuations and where verification of actuated equipment is addressed.

## Question Worksheet SRO #77 (102)

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	026 2.2.21	
	Importance		3.5

### Proposed Question:

The following plant conditions exist:

- The "A" Train of Component Cooling Water (CCW) has been declared inoperable due to a leak on the heat exchanger
- The surveillance on the "B" Train CCW automatic valves is due

The Shift Manager determines that the surveillance cannot be done until the "A" CCW heat exchanger is returned to service.

Which of the following actions should you take?

- A. Declare the "B" CCW Train inoperable and operation can continue indefinitely as long as the valves are maintained open.
- B. Declare the "B" CCW Train inoperable and satisfactorily complete the surveillance within 72 hours or shutdown.
- C. Continue operations and declare the appropriate valves inoperable but do not shutdown because the "A" Train valves are operable.
- D. Continue operations and declare the "B" train inoperable after the grace period expires unless the surveillance has been completed.

**Proposed Answer:** D, Continue operations and declare the "B" train inoperable after the grace period expires unless the surveillance has been completed.

**Explanation:** Ans. A is incorrect since the LCO is in effect after the 25% grace period expires. Ans. B would not occur in any event, as both trains would be inoperable if testing is not done in time. Ans. C is incorrect as the T.S. addresses trains made up of operable components. Ans. D is correct as described in T.S 3.0.

**Technical References:** T.S. 3.0 and 3.7.7

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1400800 obj. 11

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41  
55.43 (2)

**Comments:** Question requires an understanding of T.S. and surveillance requirements.

**Question Worksheet SRO #78 (103)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	055 EA2.03	
	Importance		4.7

**Proposed Question:**

Initial conditions:

- The plant is currently in a Refueling Outage
- Train “B” bus is de-energized for a bus inspection
- Loss of Offsite Power occurs
- “A” Diesel Generator does not start automatically

All attempts to start the available Diesel Generator from the Control Room have failed. The load dispatcher is contacted and reports that power will not be available for 8 hours. The “A” Diesel Generator and associated 4160 volt bus have been checked by electricians and no problems can be found.

Which of the following will give procedural steps to start the Diesel Generator?

- A. EMG C-0, Loss of All AC Power
- B. OFN KJ-032, Local Emergency Diesel Startup
- C. OFN NB-030, Loss of AC Emergency Bus NB01(NB02)
- D. OFN NB-034, Loss of All AC Power – Shutdown Conditions

**Proposed Answer:** B, OFN KJ-032, Local Emergency Diesel Startup

**Explanation:** Ans. A is incorrect because this blackout is occurring during a refueling and this EMG does not apply. Ans. B is correct since this is the only procedure referenced which will manually start an emergency diesel locally at the diesel. Ans. C and D are incorrect since they do not have any steps for Local emergency diesel startup, but they do have directions for Control Room startup and bus re-energization

**Technical References:** OFN NB-034, Loss of All AC Power – Shutdown Conditions; OFN KJ-032, Local Emergency Diesel Startup

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732445

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** Control Room Supervisor needs to have the ability to take actions necessary to restore power sources following a Station Blackout.



**Question Worksheet SRO #79 (104)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	057 AA2.05	
	Importance		3.8

**Proposed Question:**

The following conditions exist:

- The unit is stable at 100% power
- All systems are properly aligned in automatic

Control rods start to drive in and many annunciators go into alarm. You notice that the controlling narrow range level channels for (2 out of 4) Steam Generators have gone to zero and the feed regulating valves for (2 out of 4) Steam Generators are ramping open.

Which one of the following Off Normal Procedures should the Control Room Supervisor use for this event?

- A. OFN KA-019, Loss of Instrument Air
- B. OFN NK-020, Loss of Vital 125VDC bus NK01, NK02, NK03, or NK04
- C. OFN NN-021, Loss of Vital 120VAC Instrument Bus
- D. OFN PK-029, Loss of Non Vital 125VDC Bus PK01, PK02, PK03, or PK04 and Annunciators

**Proposed Answer:** C, OFN NN-021, Loss of Vital 120VAC Instrument Bus

**Explanation:** Ans. A is incorrect as the loss of instrument air would fail the feed regulating valves closed, not open. Ans. B is incorrect since the loss of vital 125VDC will not affect the instrumentation or the SGWLC system. Ans. C is correct in that vital 120VAC supplies power to the Steam Generator Level Control instrumentation as well as the SGWLC system. Ans. D is incorrect since Non-Vital 125VDC does not supply power to the S/G controlling instruments or the SGWLC.

**Technical References:** OFN NK-020, Loss of Vital 125 VDC Bus NK01, NK02, NK03, and NK04; OFN NN-021, Loss of Vital 120 VAC Instrument Bus; PK-029, Loss of Non-Vital 125 VDC Bus PK01, PK02, PK03, PK04, and Annunciators

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1505902, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** The operator must be able to use changes in indications to determine which procedure to enter and what actions to take when in that procedure.

**Question Worksheet SRO #80 (105)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	069 AA2.02	
	Importance		4.4

**Proposed Question:**

System Engineering has just reported that parts used to repair Letdown Containment Isolation valve BG HV-8152 were not qualified and the valve must be declared inoperable.

Which of the following actions must be taken?

BG HV-8152 ...

- A. will still close when needed, plant operations can continue if repairs are completed within 72 hours.
- B. may remain open if an operator with no other duties is stationed to manually close the valve on an SI signal.
- C. is declared inoperable but letdown may remain in service since BG HV-8160 is operable and will close on an SI.
- D. must be closed and deactivated to comply with Technical Specifications and allow plant operations to continue.

**Proposed Answer:** D, must be closed and deactivated to comply with Technical Specifications and allow plant operations to continue.

**Explanation:** Ans. A is incorrect as the valve is inoperable. If open, Containment integrity is lost. Ans. B and C are incorrect as the valve must be closed and deactivated due to its inoperability. Ans. D is correct as directed by T.S.

**Technical References:** T.S. 3.6.3 and bases for T.S. 3.6.3

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732706, obj.3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** SRO must know that containment integrity is compromised with an inoperable valve and how to restore Containment integrity.

**Question Worksheet SRO #81 (106)**

<b>Examination Outline Cross-reference:</b>	<b>Level</b>	<b>RO</b>	<b>SRO</b>
		Tier #	1
		Group #	1
		K/A #	W E04 EA2.1
		Importance	4.3

**Proposed Question:**

Given the following sequence of events:

**TIME:**

- 1000 Various Auxiliary Building Area radiation monitors alarming
- 1005 RHR sump levels observed increasing
- 1006 OFN BB-007, RCS Leakage High entered
- 1020 Reactor is tripped and SI is initiated due to the inability to maintain PZR level >6%
- 1021 EMG E-0, Reactor Trip or Safety Injection, is entered
- 1030 Auxiliary Building Area radiation monitors and sump levels continue to increase

Which one of the following will provide the correct procedural guidance for **mitigating** these events?

- A. Continue in EMG E-0 while continuing with OFN BB-007
- B. Continue in EMG E-0 ONLY
- C. Transition to EMG E-1, Loss of Reactor or Secondary Coolant
- D. Transition to EMG C-12, LOCA Outside Containment

**Proposed Answer:** D, Transition to EMG C-12, LOCA Outside Containment

**Explanation:** Ans. A incorrect as the only required procedure for these conditions is an EMG and EMG E-0 with OFN BB-007 will not handle this event adequately. Ans. B. would not mitigate the event, just identify the correct procedure to go to. Ans. D is correct as specified in EMG E-0 or EMG E-1 for the transition. Ans. C would not mitigate the event, but requires exiting to EMG C-12.

**Technical References:** EMG E-0 step 25, EMG E-1 step 21, OFN BB-007

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** 17323333, obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (7)  
55.43 (5)

**Comments:** The procedure requires the SRO to use all available indication to determine if a LOCA outside containment exists.

**Question Worksheet SRO #82 (107)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E06 EA2.1	
	Importance		4.2

**Proposed Question:**

The unit has tripped due to a LOCA condition and ESF equipment has failed to start. As a result you have entered EMG FR-C2, Response to Degraded Core Cooling.

You have just started to depressurize the Steam Generators (S/Gs) to 160 psig in accordance with the procedure when the STA reports that you now have a Red Path condition for Integrity.

Which of the following actions should you take?

- A. Transition to EMG FR-P1, Response to Imminent Pressurized Thermal Shock Conditions.
- B. Stop the S/G depressurization and if the red path does not clear, transition to EMG FR-P1.
- C. Complete EMG FR-C2 and then transition to EMG FR-P1 if the red path still exists.
- D. Complete the S/G depressurization and then transition to EMG FR-P1 if the red path still exists.

**Proposed Answer:** C, Complete EMG FR-C2 and then transition to EMG FR-P1 if the red path still exists.

**Explanation:** Ans. A is incorrect as a Caution statement warns the operator to NOT transition. Ans. B is incorrect as you are to continue the depressurization and the red path is expected. Ans. D is incorrect as you need to complete C2 before making the transition. Ans. C is correct per the Caution in FR-C2 prior to commencing the Cooldown.

**Technical References:** EMG FR-C2 Caution prior to step 14 (page 23)

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732341, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** The SRO needs to understand the reason for each Caution statement and especially times when the EOP rules of usage are bent.

**Question Worksheet SRO #83 (108)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E14 2.4.10	
	Importance		3.1

**Proposed Question:**

The plant experienced an event and is responding in EMG E-1, Loss of Reactor or Secondary Coolant.

The following alarms actuate:

- 00-059A, CSAS
- 00-059B, CISB

What operator action is now required?

- A. Stop all running Reactor Coolant Pumps.
- B. Verify the Spray Additive Tank is aligned.
- C. Ensure Reactor Coolant Pump Seal Injection is available.
- D. Open Component Cooling Water Bypass valve to containment.

**Proposed Answer:** A, Stop all running Reactor Coolant Pumps.

**Explanation:** Ans. A is correct, because CSAS sprays water on the RCP motors and CISB isolates CCW to the RCPs, in either case the RCP need to be shut down. Ans. B is incorrect but a possible answer since the spray additive tank is required to be used during a CSAS, but all procedures assume it is lined up. Ans. C is incorrect but a possible answer because Seal Injection is needed for continued operation, but since these pumps are shutdown this is not an issue. Ans. D is incorrect but a possible answer since cooling water is lost to the RCPs the operator may think restoring CCW will allow continued RCP operation.

**Technical References:** ALR 00-059A, CSAS and ALR 00-059B, CISB

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732350

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41 (10)  
55.43 (5)

**Comments:** SRO must understand the required actions based on High Containment pressure and associated annunciators.

**Question Worksheet SRO #84 (109)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	038 EA2.06	
	Importance		4.4

**Proposed Question:**

While using the EMG ES-31, Post-SGTR Cooldown using Backfill, we are required to refill the ruptured Steam Generator and cool down the RCS.

Why is increased attention given to Shutdown Margin (SDM) during this operation?

- A. The cooldown that is performed will add significant positive reactivity.
- B. The continuous charging during the plant cooldown will cause boron concentration changes.
- C. The backfill process will cause boron concentration reduction.
- D. The backfill process will remove water from the primary.

**Proposed Answer:** C, The backfill process will cause boron concentration reduction.

**Explanation:** Ans. C is correct since this will reduce the shutdown margin due to dilution of the RCS. Ans. A is incorrect since the cooldown will not add a considerable amount of positive reactivity. Ans. B is incorrect and will actually increase boron concentration, thus increasing SDM. Ans. D is incorrect and will not reduce SDM as long as flow is going to secondary side.

**Technical References:** EMG ES-31 and BD-EMG ES-31

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732326, obj. 1

**Question Source:** INPO EXAM BANK # 6089 Bank

**Question History:** DC Cook (1/8/1996)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** The SRO must use procedure basis and fundamental shutdown margin knowledge to determine the correct answer.

**Question Worksheet SRO #85 (110)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	060 AA2.04	
	Importance		3.4

**Proposed Question:**

A leak has developed in the VCT vent line between BG V-0083, VCT to Waste Gas Compressor Isolation and BG PCV-115, VCT Purge to Waste Gas Compressor.

Closing both valves has isolated the leak.

What, if any, will be the affect of this leak isolation on continued plant operations?

- A. Power operations can continue indefinitely without any changes in normal system alignments.
- B. Power operations can continue indefinitely if excess letdown is put in service in place of normal letdown.
- C. Power operations can continue by periodically venting gases through the VCT relief valve.
- D. Power operations can continue, but will be limited as a result of RCS chemistry problems.

**Proposed Answer:** D, Power operations can continue, but will be limited as a result of RCS chemistry problems.

**Explanation:** Ans. A and B are incorrect as the buildup of non-condensable gasses in the VCT will force a plant shutdown due to RCS hydrogen concentration. Ans. D is correct as the non-condensable gasses will buildup until H<sub>2</sub> can no longer be maintained in specification. Ans. C is incorrect as the VCT relief is a liquid relief off of the bottom of the VCT.

**Technical References:** M12 BG03, USAR 11.3.2.3

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1300400, obj. 3

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** Although the radioactive leak is isolated, the operator must know how isolating this leak affects long term plant operations.

**Question Worksheet SRO # 86 (111)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	E03 2.4.21	
	Importance		4.3

**Proposed Question:**

The Unit has experienced an accident. EMG E-0, “Reactor Trip or Safety Injection”, directs a transition to EMG E-1, “Loss of Reactor or Secondary Cooling”.

The following conditions exist:

- RVLIS 38%
- All RCPs STOPPED
- Core Exit TCs 750°F
- All Steam Generator WR levels 45%
- Steam Generator pressures 800 psig
- Total AFW flow 300,000 lbm/hr
- Power Range Nuclear Instruments 3%
- RCS pressure 840 psig
- Containment pressure 24 psig
- *Gamma Metrics equals power range indication*

Which ONE of the following procedures should you enter?

- A. EMG FR-H1, Response to Loss of Secondary Heat Sink
- B. EMG FR-S1, Response to Nuclear Power Generation/ATWT
- C. EMG FR-Z1, Response to High Containment Pressure
- D. EMG FR-C1, Response to Inadequate Core Cooling

**Proposed Answer:** D, EMG FR-C1, Response to Inadequate Core Cooling

**Explanation:** : Ans. A incorrect, due to adequate AFW flow, but possible due to low S/G levels. Ans. B incorrect since power range is less than 5%, but possible since it is not decreasing. Ans. C. incorrect since pressure is not greater than 60 psig, but adverse containment conditions exist. Ans. D is correct since it the only red path for the given conditions.

**Technical References:** EMG F-0 CSFSTs

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732338, obj. 3

**Question Source:** INPO EXAM BANK # 2672 Modified

**Question History:** Prairie Island (6/16/1997)

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** SRO knowledge includes knowing the entry conditions for Functional Restoration procedures in case the STA is unavailable.



**Question Worksheet SRO #87 (112)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		1
	Group #		3
	K/A #	E13 2.4.6	
	Importance		4.0

**Proposed Question:**

You have entered EMG FR-H2, Response to Steam Generator Overpressure.

Which of the following actions are taken in an attempt to terminate the cause of the pressure increase?

- A. Auxiliary Feedwater to all S/Gs is stopped until pressure is reduced.
- B. An RCS cooldown is started to reduce T-avg to less than 545°F.
- C. Condenser air removal is returned to normal to ensure steam dump capability.
- D. The Main and Startup Feedwater pumps are tripped regardless of the reason they were running.

**Proposed Answer:** B, An RCS cooldown is started to reduce T-avg to less than 545°F.

**Explanation:** Ans. A is incorrect as AFW flow is stopped until a steam release path is established and pressure could be reduced by cooldown. Ans. B is correct since this the conservative temperature corresponding to a RCS pressure to prevent lifting safeties in EMG FR-H2. Ans. C is incorrect as it is an action of the procedure but not an action to limit the pressure increase. Ans. D is incorrect as the feedpumps are left running if needed for heat removal.

**Technical References:** BD EMG FR-H2 and EMG FR-H2

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732344, obj. 4

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (10)  
55.43 (5)

**Comments:** Question tests operators understanding of the reason actions are taken in the EMGs.

**Question Worksheet SRO #88 (113)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	026 2.1.33	
	Importance		2.9

**Proposed Question:**

A test of the Containment Spray pumps was completed on the previous shift and you have been given the following information:

- "A" Containment Spray pump discharge pressure was 260 psig on Recirculation flow.
- Spray Additive tank volume is 4530 gallons.
- Spray Additive tank NaOH concentration is 32% by weight.
- Spray Additive tank pressure is 2 psig.

What action should you take?

- A. Increase the nitrogen cover gas pressure on the Spray Additive tank.
- B. Tell the chemistry group to order NaOH to increase the volume 100 gallons.
- C. Declare the "A" Containment Spray pump inoperable due to discharge pressure.
- D. Declare the Spray Additive system inoperable due to NaOH concentration.

**Proposed Answer:** D, Declare the Spray Additive system inoperable due to NaOH concentration.

**Explanation:** Ans. A is incorrect as 2 psig is normal for the system. Ans. B is incorrect as volume is almost out of spec.(4540 gal.) high as seen in the stem. Ans. C is incorrect as T.S. Bases requires pressure to be greater than 250 psig. Ans. D is correct per T.S. 3.6.7 which requires the concentration to be  $\geq 28\%$  and  $\leq 31\%$  by weight.

**Technical References:** T.S. 3.6.7 and STS EN-100A

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** SY1302600 obj. 2 and 4

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (2) (3)

**Comments:** The SRO should be able to spot failures to meet system operability requirements when looking at system data.

**Question Worksheet SRO #89 (114)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	002 2.4.10	
	Importance		3.1

**Proposed Question:**

Following a Reactor Trip, Annunciator ALR 00-056B, RCS <50 SUBCOOL, has come into Alarm. Emergency Operating Procedures are NOT in effect and the alarm has been verified to be valid.

WHICH ONE of the following is the proper guidance for this condition?

- A. Cooldown the RCS at the maximum rate achievable.
- B. Cooldown the RCS at the allowable Tech Spec limit.
- C. Maintain the current temperature and depressurize the RCS.
- D. Maintain the current temperature and RCS pressure.

**Proposed Answer:** B, Cooldown the RCS at the allowable Tech Spec limit.

**Explanation:** Ans. A is incorrect since cooling down at the maximum rate is not required per the Alarm Response and would create unnecessary vessel thermal stress. Ans. B is correct since the procedure directs you to cooldown at a rate less than the Tech Spec limit of 100 degrees/hr. Ans. C and D are incorrect since a cooldown is required, but are plausible since post trip expectations are to maintain RCS temperature and pressure control may be unavailable.

**Technical References:** ALR-0056B, RCS <50 SUBCOOL

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732418

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (10)  
55.43 (5)

**Comments:** Operators need to know reasons for Annunciator Alarms.

**Question Worksheet SRO #90 (115)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	073 2.4.4	
	Importance		4.3

**Proposed Question:**

The plant is starting up following a refueling and the following conditions exist:

- RCS Temperature 355 °F
- RCS Pressure 1100 psig
- Unidentified RCS Leakrate 5 gpm
- Pressurizer Level 27% and stable
- CHARMs Activity Increasing
- Containment Normal Sumps Increasing
- Safety Injection Accumulators Unisolated

Which of the following procedures should the Control Room Supervisor enter?

- A. OFN BB-007, RCS Leakage High
- B. OFN BB-007A, Steam Generator Tube Leakage
- C. OFN BB-031, Shutdown LOCA
- D. EMG E-0, Reactor Trip or Safety Injection

**Proposed Answer:** A, OFN BB-007, RCS Leakage High

**Explanation:** The candidate must first realize that the plant is in Mode 3. Ans. A is correct since an unidentified leak greater than allowable Tech Spec. limit requires entry into OFN BB-007. Ans. B is incorrect because tube leakage is not indicated by the above conditions. Ans. C is incorrect but plausible since the leak is into containment, but the procedure provides guidance for Mode 4, 5 and 6. Ans. D is incorrect this is a Tech Specs. entry condition but within the capacity of one charging pump. RCS leaks in Mode 1, 2 or 3 make EMG entry plausible.

**Technical References:** WCGS Technical Specifications, OFN BB-07A, Steam Generator Tube Leakage; OFN BB-007, RCS Leakage High; EMG E-0 Reactor Trip or Safety Injection; OFN BB-031, Shutdown LOCA.

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732425

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A3

**10 CFR Part 55 Content:** 55.41 (10)  
55.43 (2)

**Comments:** SROs have to be able to determine which procedure to enter based on several indications. Entering the wrong procedure could delay a possible corrective action.

**Question Worksheet SRO #91 (116)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.1.11	
	Importance		3.8

**Proposed Question:**

Which of the following Technical Specification conditions allows you a 1 hour completion time to restore compliance?

- A. The plant is in Mode 1 when one PZR PORV is determined to be inoperable.
- B. The plant is in Mode 4 when it is determined that SDM is less than required by the COLR.
- C. The plant is in Mode 1 when RCS Tavg increases to 591°F.
- D. The plant is in Mode 3 when RCS pressure spikes to 2750 psig.

**Proposed Answer:** A, The plant is in Mode 1 when one PZR PORV is determined to be inoperable.

**Explanation:** Ans. A requires you to shut the block valve within 1 hour. Ans. B requires action within 15 minutes. Ans. C is a two hour specification. Ans. D requires action within 5 minutes.

**Technical References:** T.S. 2.2.2.2, 3.1.1, 3.4.1, 3.4.11

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733207 obj. 9

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (2)

**Comments:** SRO personnel must know all 1 hour T.S. to ensure LCO actions are taken in a timely manner.

**Question Worksheet SRO #92 (117)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.1.20	
	Importance		4.2

**Proposed Question:**

While the control room staff is performing EMG E-1, Loss of Reactor or Secondary Coolant, an orange path occurs on the containment status tree requiring performance of EMG FR-Z1, Response to Containment Pressure. While completing EMG FR-Z1, the orange path clears. The control room supervisor now returns to EMG E-1 and the containment critical safety function again returns to the same orange path condition.

What action should be taken?

- A. Continue with the actions of EMG E-1.
- B. Implement EMG FR-Z1 again at step 1.
- C. Return to the last step of EMG FR-Z1 until the orange path is cleared.
- D. Return to EMG E-0, Reactor Trip or Safety Injection.

**Proposed Answer:** B, Implement EMG FR-Z1 again at step 1.

**Explanation:** Ans. A is incorrect, because if an orange path re-occurs the control room staff is still required to go to the appropriate FRP. Ans. B is correct, since this is the correct response based on the Procedure User's guide. Ans. C is incorrect in that you should go to the beginning of the FRP procedure, but may be chosen if the candidate feels that this step is the only one required to be performed. Ans. D is incorrect since you would not go back to the original ORP following the reactor trip, but may be chosen if the candidate feels that an incorrect event diagnosis was made originally and they must start over.

**Technical References:** AP 15C-003 page 30, Procedure User's Guide for Abnormal Plant Conditions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733203 obj. 8

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (10)  
55.43 (5)

**Comments:** SRO's are responsible for the proper implementation of procedures during abnormal operations.

**Question Worksheet SRO #93 (118)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.1.22	
	Importance		3.3

**Proposed Question:**

The unit is in Mode 5 and at 145°F in preparation for refueling.

Maintenance entered containment and loosened the first three Reactor Vessel head bolts.

A complete loss of Residual Heat Removal (RHR) occurred and the plant heats up to 210°F.

What MODE is the plant in?

- A. No Defined Mode
- B. Mode 6
- C. Mode 5
- D. Mode 4

**Proposed Answer:** B, Mode 6

**Explanation:** When the first RV head bolt is loosened, the Plant enters Mode 6 and remains in Mode 6 until all RV head bolts are again fully tensioned. Ans. C and D are incorrect as these modes of operation required the head bolts to be fully tensioned. Ans. B is correct for this condition. Ans. A is not a possibility, since all fuel has not been removed as given in the stem.

**Technical References:** T.S. 1.1 page 7

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732700, obj. 5

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** The Mode chart contains three footnotes, which modify the chart. Two of the footnotes discuss headbolt tensioning and add to the definition of Mode 6.

**Question Worksheet SRO #94 (119)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.2.19	
	Importance		3.1

**Proposed Question:**

Mechanical maintenance would like to perform a pre-approved work activity but the activity is not scheduled for today.

What action must be taken to perform the work?

- A. Pre-approved work can be performed at any time and does not have to be on today's schedule.
- B. The work activity can be performed on the day that it is scheduled or before that date.
- C. The work activity will have to be re-approved in order to perform the work today.
- D. The work activity can be performed if approved by the Work Week Manager or the Control Room Supervisor.

**Proposed Answer:** C, The work activity will have to be re-approved in order to perform the work today.

**Explanation:** Ans. A is incorrect as approved work must be scheduled. Ans. B is incorrect as a work activity can only be done when approved. Ans. C is correct by moving the work activity current schedule. Ans. D is incorrect as work must be re-approved prior to allowing work.

**Technical References:** AP 16C-007, Work Order, step 4.14.2

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733205 obj. 8

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (5)

**Comments:** The SRO is charged with controlling the work performed on plant equipment.



**Question Worksheet SRO #95 (120)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.2.25	
	Importance		3.7

**Proposed Question:**

Which ONE of the following identifies the Technical Specification Minimum Temperature for Criticality and its bases?

The lowest loop T-avg shall be greater than or equal to:

- A. 551 °F, to ensure the MTC is within its analyzed temperature range.
- B. 551 °F, to ensure T-avg indication is above its minimum observable value.
- C. 557 °F, to ensure the reactor vessel is above its minimum nil ductility temperature.
- D. 557 °F, to ensure the pressurizer is within its normal startup and operating range.

**Proposed Answer:** A, 551 °F, to ensure the MTC is within its analyzed temperature range.

**Explanation:** Ans. A is correct since the minimum temperature for criticality at Wolf Creek is 551 °F as stated in Tech Specs. The bases is also correct as this is the analyzed range for MTC. Ans. B is incorrect, because T-avg can be observed below 551 °F. Ans. C and D both have correct basis answers, but the temperature used is the Hot Zero Power temperature used as the minimum temperature for numerous other control systems, but not as the minimum temperature for criticality.

**Technical References:** Wolf Creek Technical Specification 3.4.2 and its bases

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732702, obj.3

**Question Source:** INPO EXAM BANK # 4494 Modified

**Question History:** Turkey Point (09/12/1997)

**Question Cognitive Level:** Memory or Fundamental Knowledge K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (2)

**Comments:** Knowledge of the minimum temperature for criticality and its bases.

**Question Worksheet SRO #96 (121)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.3.1	
	Importance		3.0

**Proposed Question:**

During a plant emergency you receive a radiation exposure in excess of 10 CFR 20 limits in order to save a life.

Which of the following actions are performed as a result of this exposure?

- A. A "Planned Special Exposure" request, APF 25B-400-1, must be completed within one week of the event.
- B. The dose received is not added to your lifetime exposure as it is a "once in a lifetime event".
- C. All exposure received shall be subtracted from the allowed lifetime limit for Planned Special Exposures.
- D. The radiation received shall be added to your lifetime exposure only if it exceeds 25 Rem.

**Proposed Answer:** C, All exposure received shall be subtracted from the allowed lifetime limit for Planned Special Exposures.

**Explanation:** Ans. A is incorrect as the document is done before the "Planned" exposure and "Life Saving" is not a planned exposure. Ans. B is incorrect as all radiation worker dose is added to your limit. Ans. C is correct in that received exposure must always be counted for lifetime limits. Ans. D is incorrect as all exposure is counted.

**Technical References:** AP 25B-400 page 5, Planned Special Exposures

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733204 obj. 1

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K3  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (12)  
55.43 (4)

**Comments:** Radiation worker limits are an individual responsibility

**Question Worksheet SRO #97 (122)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.3.3	
	Importance		2.9

**Proposed Question:**

A plant chemist calls the control room and reports a diesel fuel oil spill from a delivery truck.

Which of the following personnel can assume the position of "Emergency Coordinator" to direct activities related to this spill?

- A. Chemistry Supervisor
- B. Control Room Supervisor
- C. Water Treatment System Supervisor
- D. Fire Brigade Leader

**Proposed Answer:** B, The Control Room Supervisor

**Explanation:** Ans. B is correct as either the SM or CRS can assume the position. Ans. A, C and D are incorrect and not options available in the procedure.

**Technical References:** AP17C-006 page 5, Control Room Supervisor Qualifications and Responsibilities

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733201 obj. 2

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41  
55.43 (4)

**Comments:** This is a specific duty of the CRS/SM as identified in the Administrative procedures.

**Question Worksheet SRO #98 (123)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.3.10	
	Importance		3.3

**Proposed Question:**

Refueling is in progress when the Control Room is notified that a fuel assembly has fallen from the Refueling Machine and that clad damage is evident.

What actions must the Fuel Handling SRO perform?

- A. Direct personnel in the recovery of the dropped assembly using the Polar Crane.
- B. Notify the Containment Coordinator to close both Personnel hatches.
- C. Direct the Containment Coordinator to evacuate personnel from Containment.
- D. Ensure the Fuel Transfer Cart is in the Refueling Pool and close the transfer tube gate.

**Proposed Answer:** C, Direct the Containment Coordinator to Evacuate personnel from Containment.

**Explanation:** Ans. A is incorrect, because recovery of the damaged fuel assembly will be a planned evolution and the instructions for removal will not be done until the proper planning has been performed. Ans. B is incorrect, because only one Personnel Hatch is required to be closed, not both. Ans. C is correct, because the containment is required to be evacuated to until radiation levels can be reduced to guard against potential excessive exposure. Ans. D is incorrect, since the Fuel Transfer Cart is required to be in the Spent Fuel Pool per procedure and will prevent closing the Transfer Tube if in the Refueling Pool position.

**Technical References:** OFN KE-018, Fuel Handling Accident

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1732428

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge  
Comprehension or Analysis A2

**10 CFR Part 55 Content:** 55.41  
55.43 (4)

**Comments:** SROs are required to know directed actions of the Fuel Handling SRO.

**Question Worksheet SRO #99 (124)**

<b>Examination Outline Cross-reference:</b>	<b>Level</b>	<b>RO</b>	<b>SRO</b>
		Tier #	3
		Group #	
		K/A #	2.4.11
		Importance	3.6

**Proposed Question:**

When performing steps in the EMG procedures, when can you also perform steps in an OFN procedure?

- A. Only when needed to help mitigate the event identified in the EMG.
- B. At any time while performing an EMG as long as the OFN does not interfere with EMG actions.
- C. When performing any EMG except OFN steps must be suspended during Red or Orange Path FRP's.
- D. OFN's can only be executed during performance of EMG's when the OFN demanded the reactor trip as part of its strategy.

**Proposed Answer:** B, At any time while performing an EMG as long as the OFN does not interfere with EMG actions.

**Explanation:** Ans. A is incorrect as OFNs can be done anytime on a “not to interfere” basis. Ans. B is correct as explained in AP 15C-003. Ans. C is incorrect as no exclusion for FRPs exists. Ans. D is incorrect as other OFNs can also be done.

**Technical References:** AP 15C-003 page 12, Procedure User’s Guide for Abnormal Plant Conditions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733203 obj. 13

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (10)  
55.43 (5)

**Comments:** SRO must know how/when OFN procedures may be implemented under all possible plant conditions.

**Question Worksheet SRO #100 (125)**

<b>Examination Outline Cross-reference:</b>	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.4.16	
	Importance		4.0

**Proposed Question:**

Assuming that the entry conditions for each of the following procedures exists, which procedure takes priority for implementation?

- A. EMG FR-C1, Response to Inadequate Core Cooling
- B. EMG ES-12, Transfer To Cold Leg Recirculation
- C. EMG C-11, Loss of Emergency Coolant Recirculation
- D. EMG C-0, Loss of All AC Power

**Proposed Answer:** D, EMG C-0, Loss of All AC Power

**Explanation:** Ans. A would usually take precedence except for loss of ac power and shift to recirc. Ans. B is incorrect as ES-12 takes precedence over all procedures except C-0 and C-11. Ans. C would take precedence over most procedures but not C-0. Ans. D is correct as all other EMGs are written assuming that AC power is available to at least one vital bus.

**Technical References:** AP 15C-003 page 14, Procedure User's Guide for Abnormal Plant Conditions

**Proposed references to be provided to applicants during exam:** None

**Learning Objective:** LO1733203 obj. 13

**Question Source:** New

**Question Cognitive Level:** Memory or Fundamental Knowledge      K2  
Comprehension or Analysis

**10 CFR Part 55 Content:** 55.41 (10)  
55.43 (5)

**Comments:** The SRO must always be able to determine which procedure carries the highest implementation priority.