

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

1. The plant was operating at 90% reactor power when a transient occurred. Two minutes after the transient the following plant conditions exist:

- 4-C-02 (RECIRC B LOCKOUT) is now in alarm
- Recirc Loop A indicates a total jet pump flow of 35 Mlbm/hr
- Recirc Loop B indicates a total jet pump flow of 7 Mlbm/hr
- RPV level is 35 inches and stable
- APRM recorders are fluctuating between 68% and 69% reactor power

Given C.2-06 Figure 1; which one of the following identifies the required action(s), if any, for the OATC?

- A. No action is required due to being in the Normal Region of the Power to Flow Map.
- B. A reactor scram needs to be manually inserted due to neutron flux oscillations in the Buffer or Exclusion regions.
- C. Recirc flow needs to be raised OR control rods need to be inserted to exit ONLY the Exclusion Region of the Power to Flow Map.
- D. Recirc flow needs to be raised OR control rods need to be inserted to exit the Exclusion AND Buffer Regions of the Power to Flow Map.

D IS CORRECT: IF the stability EXCLUSION region is entered, OR the stability BUFFER region has been entered in an uncontrolled fashion, THEN immediately perform either of the following until the Reactor is operating outside of the stability BUFFER region:

- a. Increase Recirculation flow,
OR
- b. Insert control rods using C.4-F (RAPID POWER REDUCTION).

A is incorrect: The Buffer and Exclusion regions have been entered and must be exited.

B is incorrect: A reactor scram would not be required unless neutron flux oscillations were occurring. By definition, neutron flux oscillations are a 10% peak-peak change in power.

C is incorrect: Currently the plant is in the Buffer and Exclusion regions of the map. Additionally to exit the exclusion region you must pass through the Buffer region.

REFERENCE: C.4-B.05.01.02.A

10 CFR

55.41(10)

REFERENCE PROVIDED DURING EXAM: C.2-06 Figure 1

QUESTION SOURCE: ILT Bank – Minor edits to stem and choices

TIER: 1 **GROUP:** 1 **CATEGORY:** 295001 Partial or Complete Loss of Forced Core Flow Circulation

K/A: AA1.01 **IMPORTANCE:** RO 3.5 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to operate and /or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Recirculation system.

DIFFICULTY 2 **LESSON PL:** M8114L-002 **OBJECTIVE:** 2

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2. The plant was operating at rated conditions when a STATION BLACKOUT occurred. Shortly after the transient, one half of the Control Room lighting is restored.

For the above conditions, determine which of the following is the expected power availability to the Service Water Pumps (SWP)?

	<u>POWER to 11 SWP</u>	<u>POWER to 12 SWP</u>	<u>POWER to 13 SWP</u>
A.	UNAVAILABLE	UNAVAILABLE	UNAVAILABLE
B.	AVAILABLE	UNAVAILABLE	UNAVAILABLE
C.	AVAILABLE	AVAILABLE	UNAVAILABLE
D.	UNAVAILABLE	UNAVAILABLE	AVAILABLE

B IS CORRECT: Pump power is as follows:

11 SWP – LC-107 via 13 Bus or 13 DG
 12 SWP – LC-104 via 16 Bus via 14 Bus
 13 SWP – LC-102 via 14 Bus

During a Station Blackout the 13 DG may or may not start and load. The candidate must determine if this is a SBO with 13 DG or an SBO without 13 DG. With one half of CR lighting restored this is an indication that 13 DG has started and loaded; therefore, power would be available to 11 SWP from LC-107 via 13 DG. The pump can be manually started once power is restored to LC-107. This is a change from a modification performed in the 2007 RFO. 11 SWP used to be powered from LC-103 via 15 Bus and wouldn't have had power during a Station Blackout. Candidates must interpret the SWP lineups and determine the extent of the Station Blackout or if a Loss of All Offsite power has occurred.

A is incorrect: Power would still be available to 11 SWP, but is a common misconception due to the recent Mod described above. This would have been the correct configuration on a Loss of All Offsite Power prior to the Mod.

C is incorrect: 12 SWP would not have power in a SBO. This lineup could be true in a Loss of ALL Offsite Power.

D is incorrect: 13 SWP would not have power, but 13 SWP is commonly misconceived as being powered by 13 DG

REFERENCE: C.4-B.09.02.A, B.08.01.01-05 **10 CFR** 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 295003 Partial or Complete Loss of AC

K/A: AA2.05 **IMPORTANCE:** RO 3.9 **COG LEVEL:** 2DR

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: Whether a partial or complete loss of A.C. power has occurred.

DIFFICULTY 3 **LESSON PL:** M8107L-016 **OBJECTIVE:** 4

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3. The plant is shutdown for a planned maintenance outage with "A" RHR in shutdown cooling. The Control Room Operator has identified the following changes in plant conditions:
- SRM Channels 23 and 24 indications are trending down
 - IRM Channels 15, 16, 17 and 18 indications are trending down
 - Service Water Effluent monitor indication is trending down
 - RBCCW radiation monitor indication is trending down

Given the above conditions, which Abnormal Procedure should be entered AND why?

- A. LOSS OF A 125 VDC BUS for a loss of D-11 (Div 1 125 VDC Distribution Panel)
- B. LOSS OF A 125 VDC BUS for a loss of D-21 (Div 2 125 VDC Distribution Panel)
- C. LOSS OF A 24 VDC BUS for a loss of D-15 (Div 1 24 VDC Distribution Pane)
- D. LOSS OF A 24 VDC BUS for a loss of D-25 (Div 2 24 VDC Distribution Panel)

D IS CORRECT: IAW Ops Manual B.09.11-05, pg 9 the loads listed are supplied from D-25. This is MNGP specific OE. A loss of a 24 VDC Battery charger went unnoticed for a period of time resulting in the above indications

A & B are incorrect: These loads are not powered by 125 VDC

C is incorrect: This is the power supply to the other half of the SRMs and IRMs

REFERENCE: B.09.11-05

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Edits to choices

TIER: 1 **GROUP:** 1 **CATEGORY:** 295004 Partial or Total Loss of DC Pwr

K/A: 2.1.7 **IMPORTANCE:** RO 4.4 **COG LEVEL:** 1F

K/A DESCRIPTION: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

DIFFICULTY 3 **LESSON PL:** M8107L-041 **OBJECTIVE:** 5

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4. The plant is operating in Mode 1 during a plant startup. Given the following:
- One Reactor Feed Pump is in service
 - The Low Flow FW Reg. valve is in service in AUTO

Which of the following is correct if a turbine trip occurs AND the bypass valves fail CLOSED?

- A. RPV water level will initially lower due to the collapse in core voids.
- B. PCIS will initiate a Group I isolation due to lowering main steam line pressure.
- C. DFCS will shift to single element control due to the reduction in steam flow.
- D. A scram will occur due to the turbine control oil pressure lowering to <172.5 psig.

A IS CORRECT: The increase in pressure will cause voids to collapse and a reduction of indicated level. This will result in a rapid power increase and a full RPS trip from APRM high flux or RPV high pressure which will cause level to lower even more due to the collapse in voids following the scram

B is incorrect: With the Bypass valves failing to open, steam line pressure will rise. The candidate must recall that the Group 1 isolation signal is on lowering pressure <840 psig.

C is incorrect: With the Low flow FW reg. valve in service the loss of the steam flow input will have no effect on water level since DFCS is already in single element.

D is incorrect: The low control oil pressure scram in this case will be bypassed when < 30% power.

REFERENCE: C.4-B.05.09.B

10 CFR

55.43 (5)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 295005 Main Turbine Generator Trip

K/A: AK1.03 **IMPORTANCE:** RO 3.5 **COG LEVEL:** 2DR

K/A DESCRIPTION: Knowledge of the operational implications of the following concepts as they apply to MAIN TURBINE GENERATOR TRIP: Pressure effects on Reactor Level.

DIFFICULTY 2 **LESSON PL:** M8107L-048 **OBJECTIVE:** 6

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5. Which one of the following CRD Drive components provides a deceleration of the control rod drive mechanism near the end of its travel during a scram?
- A. Outer Tube
 - B. Piston Tube
 - C. Drive Flange
 - D. Inner Cylinder

B IS CORRECT: The piston tube forms the innermost fixed cylinder of the drive mechanisms. During control rod scram insertion, the series of buffer orifices near the upper end of the piston tube progressively shuts off water flow to provide a gradual deceleration to decrease the rate of movement of the drive piston and index tube.

A and D are incorrect: The inner cylinder and outer tube compose a double-walled cylindrical unit forming an annulus through which water may be applied to unlock the collet piston.

C is incorrect: The drive flange provides the means by which the drive mechanism is mounted to the reactor vessel housing flange.

REFERENCE: B.01.02-02

10 CFR 55.41(2)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank - Minor edits to stem

TIER: 1 **GROUP:** 1 **CATEGORY:** 295006 SCRAM

K/A: AK2.05 **IMPORTANCE:** RO 3.1 **COG LEVEL:** 1F

K/A DESCRIPTION: Knowledge of the interrelations between SCRAM and the following: CRD Mechanism

DIFFICULTY 2 **LESSON PL:** M8107L-021 **OBJECTIVE:** 2

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6. C.4-C (SHUTDOWN OUTSIDE THE CONTROL ROOM) contains the following CAUTION Statement:

“Do not operate any transfer switches on Panel C-292 before verifying the switch lineup per Table 1 as appropriate.”

What is the basis for this Caution? (See next page for Table 1.)

- A. To minimize any electrical transient in the control power circuits when transferring control.
- B. To ensure automatic system features will be initiated to allow safe shutdown of the reactor.
- C. To minimize the potential of a postulated hot short from repositioning equipment listed on Table 1.
- D. To prevent inadvertent system initiation from occurring if the switches were not in the correct lineup.

D IS CORRECT: Table 1 establishes the required control switch lineup for switches which do not have a spring return to normal position function or switches which have indicating flags. This lineup is established prior to the system being transferred to the ASDS Panel. The initial control switch lineup in Table 1 prevents inadvertent system initiation while manipulating ASDS switches and disabling control room controls.

A is incorrect: Control power is not transferred.

B is incorrect: This procedure assumes that no automatic shutdown features have been initiated.

C is incorrect: This is minimized by actually transferring control of SRVs, RHR, and Core Spray.

REFERENCE: C.4-C

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: C.4-C Table 1

QUESTION SOURCE: ILT Bank - 2005 ILT NRC Exam

TIER: 1 **GROUP:** 1 **CATEGORY:** 295016 Control Room Abandonment

K/A: AK3.03 **IMPORTANCE:** RO 3.5 **COG LEVEL:** 1B

K/A DESCRIPTION: Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT: Disabling control room controls.

DIFFICULTY 2 **LESSON PL:** M8114L-004 **OBJECTIVE:** 2

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Table 1 Initial Control Switch Lineup for ASDS Panel C-292	
CONTROL SWITCH	POSITION
S31, SRV DIV II TRANSFER SWITCH	NORMAL
S25, RHR B TRANSFER SWITCH	NORMAL
S26, CORE SPRAY B TRANSFER SWITCH	NORMAL
S27, NO. 12 DIESEL GEN TRANSFER SWITCH	NORMAL
S19, RV2-71E RELIEF VALVE E	AUTO
S22, RV2-71F RELIEF VALVE F	CLOSE
S20, RV2-71G RELIEF VALVE G	AUTO
S21, RV2-71H RELIEF VALVE H	AUTO
S12, 12 RHR PUMP	NEUTRAL-AFTER- STOP
S8, CV-1995 12 RHR PUMP MIN FLOW	AUTO
S11, 12 RHR SW PUMP	NEUTRAL-AFTER-STOP
S13, 12 EMERGENCY SW PUMP	AUTO
S5, 12 CORE SPRAY PUMP	NEUTRAL-AFTER-STOP
S1, MO-1742 CORE SPRAY SUCTION	OPEN
S38, 1AR TRANS TO BUS 16 ACB 152-610	NEUTRAL-AFTER-TRIP
S14, STBY DIESEL GEN ACB 152-602	NEUTRAL-AFTER-TRIP
S18, 104 LOAD CENTER PRI ACB 152-609	NEUTRAL-AFTER-TRIP
S17, 104 LOAD CENTER SEC ACB 52-401	NEUTRAL-AFTER-TRIP
S23, SOUTHWEST EQUIP ROOM	V-AC-4 OFF
S29, DIESEL OIL TRANSFER PUMP P11	OFF

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7. The plant is operating at rated conditions when an event occurs resulting in the following 15 Bus and 11 EDG indications (see picture on next page).

Based on the given indications what action is required to be directed to the Turbine Building Operator?

- A. OPEN SW-228 ('A' ESW INLET ISOLATION VALVE) to supply 'A' EDG-ESW with Service Water.
- B. CLOSE SW-228 ('A' ESW INLET ISOLATION VALVE) to prevent dead heading 'A' EDG-ESW with Service Water.
- C. CLOSE SW-239-1 (SERVICE WATER ISOLATION TO 'A' ESW) to prevent dead heading 'A' EDG-ESW with Service Water.
- D. OPEN ESW-2-1 and ESW-2-2 (ESW CROSSTIE HEADER ISOLATIONS) to crosstie 'A' EDG-ESW system to the 'B' EDG ESW system.

A IS CORRECT: If an ESW pump fails to start when an EDG initiates, the respective valve SW-228 or SW-229 is opened to provide cooling water from the service water system to prevent EDG damage from overheating. The failure of the EDG-ESW pump to start must be recognized by the panel operator in the control room and they must direct the action to be performed locally. The given drawing depicts 11 EDG running unloaded with no voltage on 15 Bus. The candidate must recognize the 11 EDG-ESW pump will be without power.

B & C are incorrect: Prior to the 2007 RFO the SW and EDG-ESW system were normally lined up cross connected. When an EDG started SW-239-1 would have to be closed to prevent dead heading the EDG-ESW pump. This has now been changed as the downstream SW isolation SW-228 is kept closed. The combination of these two valves and the past correct action make both of these distracters plausible.

D is incorrect: Opening these valves will crosstie the 'A' EDG-ESW and the 'B' EDG-ESW systems however this is not the required procedural action.

REFERENCE: B.08.01.02-05

10 CFR

55.41 (8)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 295018 Partial or Total Loss of CCW

K/A: AA1.01 **IMPORTANCE:** RO 3.3 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Backup systems.

DIFFICULTY 3 **LESSON PL:** M8107L-016 **OBJECTIVE:** 9

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8. On a complete loss of Instrument Air, which of the following WILL occur?
- A. SBGT valves fail OPEN.
 - B. CRD flow control valves fail OPEN.
 - C. EDG ventilation supply dampers fail CLOSED.
 - D. RHR pump minimum flow valves fail CLOSED.

A IS CORRECT: All valves on SBGT fail open to permit system operation.

B is incorrect: The CRD flow control valves fail closed.

C is incorrect: The EDG room ventilation dampers fail open on a loss of air.

D is incorrect: The RHR pump min flow valves will fail open.

REFERENCE: C.4-B.08.04.01.A

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Edits to choices

TIER: 1 **GROUP:** 1 **CATEGORY:** 295019 Partial or Total Loss of Inst. Air

K/A: AA2.02 **IMPORTANCE:** RO 3.6 **COG LEVEL:** 1F

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: Status of safety-related instrument air system loads

DIFFICULTY 3 **LESSON PL:** M8107L-024 **OBJECTIVE:** 8

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9. The plant was operating at rated conditions when a transient occurred resulting in a reactor scram. The CRS has entered C.5-1100 (RPV Control) and actions are being taken to place the plant in Cold Shutdown. Given the following:

- 'A' RHR is in Shutdown Cooling
- RPV pressure is 70 psig and slowly lowering

A LOCKOUT on Bus 15 occurs and 30 minutes later RPV pressure has risen to 80 psig.

With the conditions above, which one of the following is currently available AND can be used to continue the plant cooldown?

- A. RCIC
- B. HPCI
- C. 'B' Shutdown Cooling
- D. Main Turbine Bypass Valves

A IS CORRECT: IAW EOP Supplemental procedure C.5-3302 (Alternate Pressure Control) RCIC may be used for alternate pressure control as directed by the CRS in the Pressure Leg of EOP-1100. With the loss of Bus 15 the Div 1 250 VDC battery charger is lost but the battery is still available to operate RCIC.

B is incorrect: With RPV pressure below 100 psig HPCI would be isolated and not available.

C is incorrect: The candidate must recognize the loss of 'A' Shutdown Cooling due to the bus 15 Lockout and since RPV pressure is now above 75 psig (Shutdown Cooling Interlock) restoring 'A' or 'B' Shutdown Cooling is not possible.

D is incorrect: With the Bus 15 LOCKOUT, TBVS would be unavailable due to a loss of the Aux Oil Pump.

REFERENCE: C.5-3302, EOP-1100

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 295021 Loss of Shutdown Cooling

K/A: 2.4.6 **IMPORTANCE:** RO 3.7 **COG LEVEL:** 2RI

K/A DESCRIPTION: Knowledge of EOP mitigation strategies

DIFFICULTY 3 **LESSON PL:** M8114L-011 **OBJECTIVE:** 2

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10. During fuel movement from the core to the Fuel Pool, a fuel assembly becomes ungrappled and drops 20 ft. onto the top of the remaining fuel in the core. All refueling operations are stopped. Given the following timeline:

1000: The Fuel assembly is dropped

1001: Bubbles start to rise from the fuel assembly that was dropped

1002: The Refueling Bridge radiation monitor begins to alarm

1003: The Refuel Floor high airborne radiation alarm is sounded

IMMEDIATE evacuation of the refuel floor is FIRST required when...

- A. the fuel assembly is dropped.
- B. bubbles start to rise from the fuel assembly.
- C. the Refueling Bridge radiation monitor begins to alarm.
- D. the Refuel Floor high airborne radiation alarm is sounded.

A IS CORRECT: Ops Manual D.2 "Reactor Components Handling Equipment, Section 05 A.26.b.1)a.: "If it occurs that a fuel assembly or bundle is dropped, either in the fuel storage pool or the reactor vessel, the action below are to be taken: (1) Immediately clear the Refueling Floor of all personnel, even if the local radiation alarm siren has not sounded."

B is incorrect: Damaged fuel will release fission gasses and the bubbles will rise. This is a common BWR criterion for stoppage of fuel movement and evacuation. (See INPO Bank, Perry 2004 exam item on this K/A)

C & D are incorrect: Ops Manual D.2 section 5.11 directs evacuation "at once" for high radiation alarms or high airborne radiation alarms. The high radiation would probably alarm before the airborne alarm, but both of these options occur after the first requirement to evacuate.

REFERENCE: Ops Manual D.2-05, T.S.

10 CFR 55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 295023 Refueling accidents

K/A: AK1.01 **IMPORTANCE:** RO 3.6 **COG LEVEL:** 1P

K/A DESCRIPTION: Knowledge of the operational implications of the following concepts as they apply to Refueling Accidents: Radiation exposure hazards

DIFFICULTY 2 **LESSON PL:** M8107L-019 **OBJECTIVE:** 7

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11. During the performance of the quarterly HPCI surveillance test, MO-2063 (HPCI CST Suction Valve) is stroked closed to measure the closing time. While MO-2063 is stroking closed Drywell pressure exceeds 1.84 psig.

Which one of the following describes expected system response?

The HPCI system will....

- A. start and automatically realign suction to the Torus.
- B. start and MO-2063 will finish closing and automatically re-open.
- C. NOT start until MO-2063 is closed and manually re-opened from C-03.
- D. NOT align to any suction source, causing a seal-in trip on low suction pressure.

B IS CORRECT: During a HPCI auto initiation signal of either Reactor low low water level (-47") or high drywell pressure (+1.84 psig), HPCI CST Suction Valve MO-2063 receives an open signal regardless of its position.

A is incorrect: The suction will not realign to the torus.

C is incorrect: HPCI will start immediately and MO-2063 doesn't need to be manually re-opened.

D is incorrect: The low suction trip has a 15 second time delay. Even if this trip comes in it will clear because MO-2063 will re-open. Additionally the low suction trip is not seal-in

REFERENCE: B.03.02-01

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Minor edits to choices

TIER: 1 **GROUP:** 1 **CATEGORY:** 295024 High Drywell Pressure

K/A: EK2.01 **IMPORTANCE:** RO 3.9 **COG LEVEL:** 1I

K/A DESCRIPTION: Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following: HPCI

DIFFICULTY 2 **LESSON PL:** M8107L-002 **OBJECTIVE:** 7

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12. Which one of the following describes a function of the Low-Low Set System Logic?
- A. Prevents the Reactor Pressure Vessel from exceeding design pressure.
 - B. Acts as a backup to the HPCI System for automatically depressurizing the Reactor.
 - C. Provides approximately a 30 psig blowdown of the Reactor Vessel on high pressure.
 - D. Minimizes the possibility of an SRV re-opening with elevated water in its discharge line.

D IS CORRECT: The function of the SRV Low-Low Set System is to minimize the possibility of a safety/relief valve reopening while an elevated water leg is in its discharge line. The elevated water leg occurs after an SRV closes. The condensing steam in the SRV discharge line creates a vacuum which draws torus water up into the discharge line. If an SRV reopens while an elevated water leg is in its discharge line, the resulting water thrust load on the primary containment could exceed its design strength.

A is incorrect: This is performed by the safety relief function of each SRV lifting at 1109 psig.

B is incorrect: ADS is a Backup to HPCI.

C is incorrect: Approximately 80 psig blowdown is accomplished by Low-Low set.

REFERENCE: B.03.03-01

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 1 **GROUP:** 1 **CATEGORY:** 295025 High Reactor Pressure

K/A: EK3.09 **IMPORTANCE:** RO 3.7 **COG LEVEL:** 1B

K/A DESCRIPTION: Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE: Low-low set initiation.

DIFFICULTY 2 **LESSON PL:** M8107L-025 **OBJECTIVE:** 1

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13. The plant is at full power. HPCI was running for a surveillance test with ALL AVAILABLE Torus Cooling in service.

Currently:

- HPCI is secured
- C.5-1200 (PRIMARY CONTAINMENT CONTROL) has been entered
- Torus Water temperature reached 92°F and is now slowly lowering

If Bus 15 receives a LOCKOUT, which of the following is correct with regards to Torus Cooling?

- A. Div. 1 RHR pumps will Auto Start if the LOCKOUT is reset and Bus 15 is re-energized.
- B. All available Torus Cooling would NO longer be in service as defined by C.5-1200.
- C. #12 and #14 RHR pumps would be operating above their maximum desired flow rates.
- D. CV-1728 (A RHR HX SW Outlet) will remain OPEN and must be CLOSED from C-03.

C IS CORRECT: RHR Pumps #12 and #14 would be operating above their rated flowrates due to the loss of #11 and #13 RHR pumps and the cross-connect valve open. With the loss of Div 1 pumps the Div 2 pumps would be pumping torus cooling through both loops and operating near runout conditions. As used in this step, "available" means that the pumps and support systems necessary to supply suppression pool cooling are capable of performing their identified function and can be placed in service to provide cooling. If a pump cannot be operated due to plant conditions or physical restrictions, it is not considered "available."

A is incorrect: RHR Pumps #11 and #13 will not auto start because their breakers trip on undervoltage.

B is incorrect: This is based on EOP definition. Just because all torus cooling is not in service due to the loss of power, doesn't mean All available torus cooling is not in service.

D is incorrect: CV-1728 would close due to the tripping of "11" and "13" RHRSW pumps.

REFERENCE: C.5.1-1200, ARP 3-A-42

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Edits to stem and choices.

TIER: 1 **GROUP:** 1 **CATEGORY:** 295026 Suppression Pool High Water Temp

K/A: EA1.01 **IMPORTANCE:** RO 4.1 **COG LEVEL:** 3PEO

K/A DESCRIPTION: Ability to operate and/or monitor the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Suppression pool cooling.

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 2

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14. The plant was operating at rated conditions when a transient occurred. Drywell temperature has risen to 250°F near the reference leg vertical runs and Reactor Building (RB) temperature is 185°F. Given the following:

- RPV pressure is 1000 psig
- Drywell pressure is 10 psig
- Fuel Zone level instruments read -49 inches
- Safeguards level instruments read -45 inches
- Vessel Flood level instruments read -40 inches

Which of the above RPV water level indicators are currently providing a reliable RPV level indication?

- A. NONE of the instruments.
- B. Fuel Zone instruments ONLY.
- C. Fuel Zone AND Safeguard instruments ONLY.
- D. ALL three of the instruments.

C IS CORRECT: Based on given temperatures, only the Safeguards and Fuel Zone instruments can be used. With RB temperature < 200F, Safeguard instruments are good to -49 inches. Fuel Zone instruments are good to -322 inches provided the recirc pumps are tripped which they would be with DW pressure at 10 psig.

A is incorrect: This is plausible if the candidate misreads Detail B and doesn't think Detail C applies because RB temperature is below 200°F.

B is incorrect: The Safeguards instruments are usable, however this is a plausible choice if the candidate misreads Detail C and uses the >200°F portion of the detail.

D is incorrect: Using Detail C the Vessel Flood instruments are only reliable down to -11 inches for the given conditions.

REFERENCE: C.5.1-1000

10 CFR

55.41(8, 10)

REFERENCE PROVIDED DURING EXAM: C.5-1100 Details A, B & C

QUESTION SOURCE: ILT Bank

TIER: 1 **GROUP:** 1 **CATEGORY:** 295028 High Drywell Temperature

K/A: EA2.03 **IMPORTANCE:** RO 3.7 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE: Reactor water level

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 2

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15. What is the basis for the requirement in EOP-1200 (PRIMARY CONTAINMENT CONTROL) to perform an Emergency Depressurization (Blowdown) at the prescribed Torus low water level?

Torus level at the blowdown limit will result in...

- A. chugging if a primary system break were to occur and drywell sprays are initiated.
- B. water hammer if a SRV were to actuate resulting in possible structural damage to the containment.
- C. a loss of pressure suppression capability and primary containment structural limits may be exceeded.
- D. the torus becoming pressurized if a SRV were to actuate resulting in possible structural damage to the containment.

C IS CORRECT: Torus water level must be maintained above -3.33 ft (rounded to -3.3 ft) to ensure that steam discharged from the drywell into the torus following a primary system break will be adequately condensed. If a primary system break were to occur with torus water level below the elevation of the downcomers, pressure suppression capability would be unavailable and primary containment pressure could exceed structural limits.

A is incorrect: This may only occur if drywell sprays are initiated below 12 psig in the drywell.

B is incorrect: Water hammer would not occur in this situation as the downcomers would be void of water and less water in the SRV tailpipe would reduce water hammer effects.

D is incorrect: This would not occur until torus level is below -5.9 ft.

REFERENCE: C.5.1-1200

10 CFR

55.41(3)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Minor edits to stem and distracters

TIER: 1 **GROUP:** 1 **CATEGORY:** 295030 Low Suppression Pool Wtr Lvl

K/A: 2.4.6 **IMPORTANCE:** RO 3.7 **COG LEVEL:** 1B

K/A DESCRIPTION: Knowledge of EOP mitigation strategies

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

16. Given the following conditions:

- 3 ADS valves are open per C.5-2002 (EMERGENCY DEPRESSURIZATION)

Place the following in the order of preference (**most desirable to least desirable**) that assures adequate core cooling.

- a. RPV water level –120 inches with injection from CRD
- b. RPV water level –155 inches with injection from LPCI
- c. RPV water level –165 inches with rated injection from Core Spray

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

D IS CORRECT: Submergence is the preferred method for cooling the core. The core is adequately cooled by submergence if RPV water level is above the top of the active fuel. The order of preference is core submergence, 2/3 height, steam cooling with injection.

A is incorrect: 2/3 core height with Core Spray is preferred over steam cooling with injection.

B and C are incorrect: They do not begin with core submergence.

REFERENCE: C.5.1-1000

10 CFR 55.41(2)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank - 2007 & 2005 MNGP NRC Exams – minor edits

TIER: 1 **GROUP:** 1 **CATEGORY:** 295031 Reactor Low Water Level

K/A: EA2.04 **IMPORTANCE:** RO 4.6 **COG LEVEL:** 1B

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL: Adequate core cooling

DIFFICULTY 2 **LESSON PL:** M8114L-005 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

17. The plant is operating at rated conditions when a Group 1 isolation results in a scram and numerous control rods FAIL to insert. C.5-2007 (FAILURE TO SCRAM) has been entered.

The OATC chooses to perform Part D (RESCRAM CONTROL RODS) of procedure C.5-3101 (ALTERNATE ROD INSERTION).

Which of the following is CORRECT for the performance of Part D?

- A. Low Low Set will be disabled during a portion of Part D.
- B. RPV water level must be \geq -47 inches to perform Part D.
- C. BOTH divisions of RPS power are required to perform Part D.
- D. CRDH flow will add additional positive reactivity once the scram is reset.

A IS CORRECT: In order for Lo-Lo Set to operate automatically, a scram signal must be present. **C.5-3101**
CAUTION: Low Low Set will not operate with the scram reset.

B is incorrect: The ATWS signal that would be present $<$ -47 inches can be bypasses by opening two breakers using Part D.

C is incorrect: Only one division of RPS would be required to reset the scram and perform Part D.

D is incorrect: When the scram is reset CRD injects less water into the core.

REFERENCE: C.5-3101

10 CFR

55.41(5)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 295037 Scram condition present and reactor power above APRM downscale or unknown

K/A: 2.1.32 **IMPORTANCE:** RO 3.8 **COG LEVEL:** 1P

K/A DESCRIPTION: Ability to explain and apply system limits and precautions.

DIFFICULTY 2 **LESSON PL:** M8114L-005 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

18. A plant transient has occurred which has resulted in fuel failure. Drywell pressure has risen to the point that Primary Containment venting is required.

Which one of the following methods of venting would result in the LOWEST radioactive release to the public?

- A. Hard Pipe Vent
- B. 2 inch line from Torus
- C. 2 inch line from Drywell
- D. 18 inch line from Drywell

B IS CORRECT: This is the preferred method as the Torus will provide a scrubbing effect and the discharge will be filtered and elevated via SBT.

A is incorrect: This would result in the maximum release as it would be an unfiltered ground release.

C is incorrect: There would be no scrubbing effect when containment is vented from the Drywell.

D is incorrect: There would be no scrubbing effect when containment is vented from the Drywell and using the 18 inch line would raise the chances of ductwork damage increasing the release rates.

REFERENCE: C.5-3505

10 CFR 55.41(12)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Minor stem edits – 2002 MNGP NRC Exam

TIER: 1 **GROUP:** 1 **CATEGORY:** 295038 High Off-site Release Rate

K/A: EK1.02 **IMPORTANCE:** RO 4.2 **COG LEVEL:** 1F

K/A DESCRIPTION: Knowledge of the operational implications of the following concepts as they apply to HIGH OFF-SITE RELEASE RATE: Protection of the general public

DIFFICULTY 2 **LESSON PL:** M8114L-011 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

19. The plant is operating at rated conditions when a small fire starts in the #11 EDG Room.

Which of the following describes the response of the EDG Room Preaction Sprinkler System?

If a thermal electric detector is activated...

- A. the Wet Pipe system will spray when the fusible link melts.
- B. spray will NOT occur until a second EDG Room detector is activated.
- C. the sprinkler valve opens, immediately spraying water from the spray heads in the #11 EDG Room.
- D. the sprinkler valve opens admitting water to the sprinkler piping but doesn't spray until the fusible link melts.

D IS CORRECT: When ambient temperatures reach a high setpoint, the thermal electric detectors actuate opening the sprinkler valve and admitting water to the sprinkler piping. If the temperature in the area of a sprinkler head reaches higher setpoint, the fusible link on that head melts allowing water to flow.

A is incorrect: This is not a wet pipe system.

B is incorrect: A second detector isn't required to activate the system

C is incorrect: Immediate spray will not occur until 160°F when the fusible link melts.

REFERENCE: B.08.05-01

10 CFR

55.41(8)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 600000 Plant Fire On Site

K/A: AK2.01 **IMPORTANCE:** RO 2.6 **COG LEVEL:** 1I

K/A DESCRIPTION: Knowledge of the interrelationships between PLANT FIRE ON SITE and the following: Sensors / detectors and valves

DIFFICULTY 3 **LESSON PL:** M8107L-010 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

20. The plant is operating at rated conditions when a grid disturbance results in lowering frequency on the Main Generator. Plant conditions stabilize and the following conditions exist:

- 8-A-34 (1-BUS 345 KV LOW FREQ) is in alarm.
- Generator frequency is steady at 58.9 Hz

The above conditions remain as is and the CRS directs a Manual Scram IAW C.4-K (IMMEDIATE REACTOR SHUTDOWN) and a Turbine Trip IAW C.4-A (REACTOR SCRAM). Complete the following statement?

This direction is...

- A. NOT REQUIRED; the generator can operate indefinitely at this frequency.
- B. REQUIRED; below 59.0 Hz an automatic generator trip should have occurred.
- C. REQUIRED; at lower grid frequencies the generator may become overloaded from excessive reactive currents.
- D. REQUIRED; after a set amount of time at this frequency, vibratory stresses may cause damage to the turbine buckets.

D IS CORRECT: If the generator is operated for up to 45 minutes with a frequency of $\pm 0.6-1.4$ Hz then a manual scram and turbine trip should be performed IAW the above listed procedures. This is performed because there is a strong possibility that at least one mode of bucket vibration will be stimulated more than it was intended to be. This condition could lead to premature failures in the buckets, tie wires or cover assemblies.

A is incorrect: The generator may operate indefinitely at $60 \text{ Hz} \pm 0.6 \text{ Hz}$

B is incorrect: This trip will not occur until 58.5 Hz

C is incorrect: Lowering grid frequency will not result in excessive reactive currents and will not overload the generator.

REFERENCE: ARP 8-A-34, B.09.02-02

10 CFR

55.43 (10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 700000 Generator Voltage and Electric Grid Disturbances

K/A: AK3.02 **IMPORTANCE:** RO 3.6 **COG LEVEL:** 2DR

K/A DESCRIPTION: Knowledge for the reasons of the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Actions contained in abnormal operating procedures for voltage and grid disturbances.

DIFFICULTY 3 **LESSON PL:** M8107L-034 **OBJECTIVE:** 8

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

21. The plant has been operating at rated power for several weeks. It has been determined that air binding is occurring in the main condenser waterboxes.

Which of the following would result from the air binding?

- A. Offgas system flow will rise.
- B. Main Generator output will rise.
- C. Condenser vacuum will degrade.
- D. Circ Water condenser outlet temperature will lower.

C IS CORRECT: Air binding in the condenser water boxes will cause lower circ water flow and this will cause main condenser vacuum to degrade.

A is incorrect: With degraded condenser vacuum, there is less vacuum to draw in non-condensables and this will cause Offgas flow to lower.

B is incorrect: With degraded condenser vacuum, main generator output will lower as the generator is operating less efficiently.

D is incorrect: Circ water condenser outlet temperature will rise if one or more waterboxes are getting air bound.

REFERENCE: C.4-B.06.04.A

10 CFR

55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 1 **GROUP:** 2 **CATEGORY:** 295002 Loss of Main Condenser Vac

K/A: AK1.03 **IMPORTANCE:** RO 3.6 **COG LEVEL:** 2RI

K/A DESCRIPTION: Knowledge of the operational implications of the following concepts as they apply to LOSS OF MAIN CONDENSER VACUUM: Loss of heat sink

DIFFICULTY 3 **LESSON PL:** M8114L-002 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

22. Following a leak in the drywell, a Group 2 Isolation occurs on high drywell pressure.

Which of the following completes the statement below?

With the isolation signal still present, in accordance with plant procedures, the H₂/O₂ Analyzer sample valves may be opened....

- A. at any time as this system is not included in the Group 2 Isolation circuitry.
- B. after the GROUP 2/SCMT ISOLATION RESET switch on C-04 has been placed in both RESET positions.
- C. after INBD H₂/O₂ VALVES CLOSE/ISOL BYPASS switch AND OTBD H₂/O₂ VALVES CLOSE/ISOL BYPASS switch are placed in ISOL BYPASS position.
- D. after jumpers are installed in Panel C-15 to defeat the isolation signals AND the GROUP 2/SCMT ISOLATION RESET switch on C-04 has been placed in both RESET positions.

C IS CORRECT: IAW Ops Manual procedure C.5-3501:

IF a Group 2 isolation exists.

THEN place INBD H₂/O₂ VALVES CLOSE/ISOL BYPASS switch

AND OTBD H₂/O₂ VALVES CLOSE/ISOL BYPASS switch to ISOL BYPASS.

A is incorrect: The isolation signal must be reset. This system is part of the isolation circuitry but has a separate reset circuitry.

B is incorrect: This switch is required for Group 2/3 isolations, however, is not required for this system because it has its own reset switch.

D is incorrect: Jumpers may be required for the purge and vent valves but not for the sampling system.

REFERENCE: C.5-3501

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Minor edits to stem and distracters

TIER: 1 **GROUP:** 2 **CATEGORY:** 295010 High Drywell Pressure

K/A: AA1.04 **IMPORTANCE:** RO 3.1 **COG LEVEL:** 1P

K/A DESCRIPTION: Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: Drywell sampling system.

DIFFICULTY 2

LESSON PL: M8114L-011 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

23. The reactor is operating in MODE 2 with #1 Turbine Bypass Valve ~90% open. HPCI is in operation due to surveillance testing.

Which of the following is the HIGHEST Torus water temperature that if reached, would still allow the continuance of HPCI testing IAW Technical Specifications?

- A. 89°F
- B. 94°F
- C. 99°F
- D. 109°F

C IS CORRECT: Based on plant conditions the candidate must determine that the plant is > 1% RTP. Additionally the candidate must interpret that with torus temperature >100°F and performance of testing that adds heat to the torus, all testing that adds heat to the suppression pool must be immediately suspended.

A is incorrect: This is plausible as it is approaching the EOP entry temperature limit (90°F) and the highest allowed limit if no testing were in progress.

B is incorrect: This is plausible if the candidate believes that the limit is to suspend testing above 95°F.

D is incorrect: This is plausible as it is approaching the scram limit for torus water temperature (110°F)

REFERENCE: TS 3.6.2.1

10 CFR 55.41(9)

REFERENCE PROVIDED DURING EXAM: None – TS Entry and ≤ 1 hour action

QUESTION SOURCE: New

TIER: 1 **GROUP:** 2 **CATEGORY:** 295013 High Suppression Pool Temp

K/A: AA2.01 **IMPORTANCE:** RO 3.8 **COG LEVEL:** 2DR

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE: Suppression pool temperature.

DIFFICULTY 2 **LESSON PL:** M8107L-044 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

24. The plant is operating at rated conditions when an event occurred resulting in an ATWS condition. The CRS has entered C.5-2007 (Failure to Scram) and directs the BOP operator to inhibit ADS.

Which of the following is the basis for performing this step?

Inhibiting ADS prevents...

- A. a large RPV water level swell resulting in the addition of positive reactivity.
- B. a rapid loss of RPV inventory that would result in a loss of adequate core cooling.
- C. the addition of a large amount of heat to the suppression pool which would challenge the Heat Capacity limit.
- D. a power excursion due to the injection of cold, unborated water as RPV pressure lowers which could result in core damage.

D IS CORRECT: In C.5-2007, RPV water level may be intentionally lowered below the ADS setpoint to reduce reactor power. ADS actuation is prevented for the following reasons:

(1) ADS actuation can impose a severe thermal transient on the RPV and may complicate efforts to control RPV water level. (2) If only steam driven systems are available for injection, ADS actuation may directly lead to loss of adequate core cooling and subsequent core damage. (3) The conditions assumed in the design of the ADS actuation logic (e.g., no operator action for 10 minutes after event initiation) may not exist when the actions specified in this procedure are being carried out. (4) The operator can draw on much more information than is available to the ADS logic (e.g., equipment out of service, operating experience with certain systems, probability of restoration of off site power, etc.) and can better judge, based on instructions contained in the procedure, when and how to depressurize the RPV. (5) Subsequent steps provide explicit and detailed instructions for RPV water level control and identify the specific conditions when a blowdown is required. (6) Rapid, uncontrolled injection of relatively cold, unborated water could occur as RPV pressure decreases. If the reactor is not shutdown or if the shutdown margin is small, this could add sufficient positive reactivity to cause a power excursion large enough to damage the core.

A is incorrect: Swell will occur if these valves open, but it's not the reason for performing this step. Additionally swell raises water level by raising the amount of voids which will actually add negative reactivity.

B is incorrect: This would not occur with all injections sources available.

C is incorrect: Although unnecessary heat would be added, this is not the reason for performing the step.

REFERENCE: C.5.1-2007

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Stem edits

TIER: 1 **GROUP:** 2 **CATEGORY:** 295015 Incomplete Scram

K/A: 2.4.18 **IMPORTANCE:** RO 3.3 **COG LEVEL:** 1B

K/A DESCRIPTION: Knowledge of the specific bases for EOPs

DIFFICULTY 2 **LESSON PL:** M8114L-005 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

25. The plant was operating at 25% when an inadvertent valve manipulation caused a Primary Containment leak resulting in the following conditions:
- Drywell pressure is 2.2 psig and rising slowly
 - Drywell equipment sump temperature is 145°F.
 - RPV level lowered to +13" and is currently at +40" and stable.

Which statement below is CORRECT with regard to the status of the Drywell Equipment Drain Sump (S-43)?

- A. BOTH Drywell Equipment Drain Sump pumps should be running with the sump heat exchanger in service.
- B. The Drywell Equipment Drain Sump pump that was in AUTO should be running with the sump heat exchanger in service.
- C. BOTH Drywell Equipment Drain Sump pumps should be tripped with discharge isolation valves AO-2561A and AO-2561B SHUT.
- D. BOTH Drywell Equipment Drain Sump pumps should be tripped with discharge isolation valves AO-2561A and AO-2561B OPEN.

C IS CORRECT: With a Full Group 2 isolation at 1.84 psig in the Drywell, both DEDS pumps will be tripped and the discharge isolation valves closed. Additionally the candidate must determine that with the isolation present the sump pumps will not go into recirc even though there is a high temp signal.

A is incorrect: Both pumps will receive a trip signal.

B is incorrect: Both pumps will receive a trip signal.

D is incorrect: Both Discharge Isolation valves will be closed.

REFERENCE: B.05.06-02 / B.07.01-02 pg 8

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Edits to Stem

TIER: 1 **GROUP:** 2 **CATEGORY:** 295020 Inadvertent Cont. Isolation

K/A: AK2.10 **IMPORTANCE:** RO 2.9 **COG LEVEL:** 2DR

K/A DESCRIPTION: Knowledge of the interrelations between INADVERTENT CONTAINMENT ISOLATION and the following: Drywell equipment/floor drain sumps

DIFFICULTY 4 **LESSON PL:** M8107L-070 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

26. The plant was performing a normal reactor startup when a loss of both CRD pumps occurred. The CRS has directed the insertion of a manual reactor scram.

Given B.01.02-06 Figure 10, which of the following reactor pressures would result in the SHORTEST scram time from position 48 to position 04?

- A. 300 psig
- B. 480 psig
- C. 660 psig
- D. 980 psig

A IS CORRECT: The candidate must recognize the 90% insertion graph must be used for insertion from 48 to 04. 300 psig will result in a scram time of 2.3 seconds.

B is incorrect: 480 psig as this results in a scram time of 2.7 seconds.

C is incorrect: 660 psig as this results in a scram time of 2.7 seconds.

D is incorrect: 980 psig as this results in a scram time of 2.5 seconds.

REFERENCE: B.01.02-06 Figure 10 (Scram Insertion Time vs. Reactor Pressure) **10 CFR** 55.43 (6)

REFERENCE PROVIDED DURING EXAM: B.01.02-06 Figure 10

QUESTION SOURCE: New

TIER: 1 1 **GROUP:** 2 **CATEGORY:** 295022 Loss of CRD Pumps

K/A: AK2.07 **IMPORTANCE:** RO 3.4 **COG LEVEL:** 3SPR

K/A DESCRIPTION Knowledge of the interrelations between LOSS OF CRD PUMPS and the following: Reactor Pressure (SCRAM Assist): Plant Specific

DIFFICULTY 2 **LESSON PL:** M8107L-021 **OBJECTIVE:** 5

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

27. The plant is operating at rated conditions when a system break results in a temperature of 120°F in the area of Reactor Vessel Level and Pressure Racks (C-55 & C-56).

Which of the following describes the bases for isolating the affected system in this specific area when 120°F is reached?

The affected system is isolated...

- A. because this temperature is a definite indication that a primary system break has occurred.
- B. to ensure personnel can enter and perform actions necessary to facilitate a safe shutdown of the plant.
- C. because this temperature exceeds the environmental qualification of accident mitigation equipment in that area.
- D. to prevent a non-conservative reactor level indication at 130°F because of instrument sensitivity to temperature changes.

B IS CORRECT: Leaks are isolated as soon as they are detected to assure secondary containment habitability and equipment needed for safe shutdown remain available. Candidates must recognize the different requirements for the East elevation. Operation of equipment may be required in this area and the Max Normal and Max Safe values are based on personnel entry.

A is incorrect: Temperatures greater than max normal are indications of a fire or high energy line break, but does not assure the break is a primary system discharging into secondary containment.

C is incorrect: Temperatures greater than Max Safe (130°F) exceed the environmental qualification of accident mitigation equipment in this area not 120°F.

D is incorrect: Temperatures greater than 200°F at reactor bldg. elev. 962 East result in inaccurate level indications.

REFERENCE: C.5-1-1300

10 CFR

55.41 (5,10)

REFERENCE PROVIDED DURING EXAM: C.5-1300 Detail W

QUESTION SOURCE: New

TIER: 1 1 **GROUP:** 2 **CATEGORY:** 295032 High Secondary Containment Area Temperature

K/A: EK3.03 **IMPORTANCE:** RO 3.8 **COG LEVEL:** 2DR

K/A DESCRIPTION: Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Isolating affected systems.

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

28. The Crew has responded to a high power ATWS condition concurrent with a loss of high pressure injection systems. The following conditions are now present:

- All rods are fully inserted
- Bus 16 is locked out
- 3 ADS valves are open
- Torus water temperature is 200°F
- Torus water level is 2 ft, 0 inches
- Drywell pressure is 4.6 psig and stable

Using the above information, which one of the following values is the maximum RHR flow rate that can be obtained to restore RPV water level and avoid pump cavitation?

- A. 8000 gpm
- B. 6000 gpm
- C. 5000 gpm
- D. 3500 gpm

B IS CORRECT: Torus overpressure is calculated to be approximately 7.04 psig. If possible, the RHR pumps should always be operated within the NPSH limits. Exceeding these limits should take into consideration (among other things) the current trend of plant parameters. RHR flow should be operated at the maximum flow rate possible to reduce torus temperature.

A is incorrect: This action would be too much flow and jeopardize adequate NPSH.

C is incorrect: It is on the 1 pump curve.

D is incorrect: This would not be the maximum flow rate available to be used.

REFERENCE: C.5.1-1000, C.5.1-1200 **10 CFR** 55.41(8)

REFERENCE PROVIDED DURING EXAM: C.5.1-1000 Figure 28 RHR NPSH Limit curve

QUESTION SOURCE: ILT Bank – Edits to Stem

TIER: 2 **GROUP:** 1 **CATEGORY:** 203000 RHR/LPCI: Injection Mode

K/A: A2.01 **IMPORTANCE:** RO 3.2 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to (a) predict the impacts of the following on the RHR/LPCI: INJECTION MODE; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Inadequate net positive suction head.

ONLY part (b) of K/A met: Using procedural allowances for RHR pumps and EOP procedure graphs, only meets the second part of K/A. Attempts to match both portions of the K/A resulted in a low difficulty or SRO ONLY question. This is the higher cog portion of this K/A, and is allowed IAW NUREG 1021 ES-401 D.2.a paragraph 2.

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

29. The 11 RHR Pump is operating in a Normal Shutdown Cooling Mode. Given the following:
- 11 RHRSW Pump is in operation with a flow rate of 2000 gpm
 - 11 RHR pump flow is 3800 gpm
 - RHR HX dP is 50 psid

Which of the following actions would be appropriate in order to raise the cooldown rate?

Throttle...

- A. CLOSED RHR-4-1 (11 RHR HX INLET).
- B. OPEN MO-2002 (11 RHR HX BYPASS).
- C. OPEN RHR-5-1 (11 RHR HX DISCHARGE).
- D. OPEN CV-1728 (11 RHR HX RHRSW OUTLET).

D IS CORRECT: If increased cooldown rate is desired, then perform one or more of the following actions as required to achieve the desired cooldown rate:

- Throttle open RHR-4-1
- Throttle closed MO-2002
- Increase RHRSW flow while maintaining RHR HX dP > 20 psid

Operating the RHRSW controller in manual from the control room in the open direction will raise RHRSW flow which is allowed as long as dP remains > 20 psid. With the given conditions there is plenty of room to adjust.

A, B are incorrect: Adjusting these valves is allowed per procedure but the wrong direction is given and both adjustments will cause cooldown rate to lower.

C is incorrect: This adjustment would raise cooldown rate but the valve is normally full open and this adjustment isn't IAW the procedure.

REFERENCE: B.03.04

10 CFR 55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Edits to choices

TIER: 2 **GROUP:** 1 **CATEGORY:** 205000 Shutdown Cooling

K/A: A4.11 **IMPORTANCE:** RO 3.2 **COG LEVEL:** 2DR

K/A DESCRIPTION: Ability to manually operate and/or monitor in the control room: Heat exchanger cooling flow

DIFFICULTY 2 **LESSON PL:** M8107L-023 **OBJECTIVE:** 9

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

30. The reactor is operating at full power during a Division II on-line maintenance workweek. The Y-82 (120V INST AC ALT SOURCE XFMR) supply breaker off MCC-144 has been taken to the electrical shop for preventive maintenance.

Later in the day, a request is received to shut down Y-81 (DIV 2 120VAC CLASS 1E INVERTER) to perform scheduled preventive maintenance and repairs.

Complete the statement below that correctly describes the result of removing Y-81?

Division 2 UPS Instrument power will be...

- A. LOST resulting in the inoperability of HPCI and ASDS.
- B. MAINTAINED without interruption if the Y-83 Maintenance Bypass Switch is placed in BYPASS.
- C. LOST resulting in the inoperability of the Rod Worth Minimizer, RCIC and the Inboard MSIV test logic.
- D. MAINTAINED without interruption because the Static Switch will automatically shift to the backup power source.

A IS CORRECT: Supply breaker (4482) to Y-82 Alternate AC transformer is removed for PMs; if Y-81 is shutdown the Y-30 and Y-80 Instrument Distribution Panels will lose power and HPCI and ASDS control circuits will be rendered inoperable.

B is incorrect: Power will still not be maintained if this switch is placed in BYPASS as it is supplied via Y-81.

C is incorrect: Power is lost, but entry into TS actions for these components would NOT be required. They would be for a loss of Y-10/70.

D is incorrect: Power will not be maintained as the backup source is already out of service.

REFERENCE: C.4-B.09.13.G

10 CFR

55.41(7, 10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Choice edits

TIER: 2 **GROUP:** 1 **CATEGORY:** 206000 HPCI

K/A: 2.2.36 **IMPORTANCE:** RO 3.1 **COG LEVEL:** 2RI

K/A DESCRIPTION: Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

DIFFICULTY 3 **LESSON PL:** M8114L-003 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

31. A loss of ALL Off-Site Power has just occurred coincident with an ECCS initiation signal.

Nominally, the No. 11 and No. 12 Core Spray Pumps will auto start _____ seconds after the loss of power event.

- A. 10
- B. 15
- C. 20
- D. 25

D IS CORRECT: There is a 10-sec. delay for the EDG to load onto the dead bus, followed by a 15-sec. delay before starting the Core Spray pumps.

Electrical Power Interlocks:

If normal auxiliary electrical power is available at the time of an ECCS automatic initiation, the starting of the RHR and Core Spray pumps will be delayed to limit the maximum motor starting load. The time delays employed are as follows:

<u>Time</u>	<u>Essential Bus 15</u>	<u>Essential Bus 16</u>
5 seconds	11 RHR Pump	12 RHR Pump
10 seconds	13 RHR Pump	14 RHR Pump
15 seconds	11 Core Spray Pump	12 Core Spray Pump

If normal auxiliary electrical power is not available at the time of an ECCS automatic initiation, a ten second delay is added to the above times to allow the two Emergency Diesel Generators to start, come up to speed and for their respective breakers to CLOSE.

A is incorrect: Plausible time for EDG start.

B is incorrect: Plausible start time for CS pumps if the 10 second EDG delay is forgotten.

C is incorrect: Plausible if candidate doesn't realize 1AR will not supply power for a Loss of All Off-site power.

REFERENCE: B.03.04-02

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 2 **GROUP:** 1 **CATEGORY:** 209001 LPCS

K/A: K1.10 **IMPORTANCE:** RO 3.7 **COG LEVEL:** 1I

K/A DESCRIPTION: Knowledge of the physical connections and/or cause-effect relationships between LOW PRESSURE CORE SPRAY SYSTEM and the following: Emergency generator.

DIFFICULTY 2 **LESSON PL:** M8107L-005 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

32. A plant transient has occurred that resulted in an automatic initiation and injection from the Division 1 Core Spray system. MO-1753 (DIV 1 CS INJECTION INB) is full open with an ECCS initiation signal still present.

Can MO-1753 be used to throttle Core Spray flow? Why or why not?

- A. NO, this valve CANNOT be closed with an initiation signal still present.
- B. NO, MO-1751 (DIV 1 CS INJECTION OTB) should be used for throttling flow with an initiation signal present.
- C. YES, placing HS 14A-S16A (DIV 1 CS Injection Bypass) keylock switch to "BYPASS" will bypass the MO-1753 open signal.
- D. YES, placing HS 14A-S1A for MO-1753 (DIV 1 CS INJECTION INB) in the "CLOSE" position will bypass the MO-1753 open signal.

D IS CORRECT: After an automatic start of a Core Spray loop, the flow may be throttled with the inboard isolation valve (MO-1753 or MO-1754) using the control switches on Panel C-03. The inboard isolation valve logic is designed such that an automatic open signal is bypassed when its control switch is taken to the close position. The bypassing of the automatic opening signal is then sealed in, regardless of switch position, until the automatic open signal is no longer present.

A is incorrect: The initiation signal doesn't have to be clear and the valve open "seal in" may be bypassed.

B is incorrect: The open signal must be bypassed using the key locked switch, and this valve CANNOT be throttled.

C is incorrect: This switch allows closing of the outboard valve for isolation.

REFERENCE: B.03.01-01 **10 CFR** 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 2 **GROUP:** 1 **CATEGORY:** 209001 LPCS

K/A: A1.08 **IMPORTANCE:** RO 3.3 **COG LEVEL:** 1I

K/A DESCRIPTION: Ability to predict and/or monitor changes in parameters associated with operating the LOW PRESSURE CORE SPRAY SYSTEM controls including: System lineup.

DIFFICULTY 3 **LESSON PL:** M8107L-005 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

33. The plant was operating at rated power when a transient occurred that resulted in a Bus 16 LOCKOUT, reactor scram, and a hydraulic ATWS. The OATC initiates SBLC as directed by the CRS.

Which of the following describes the expected conditions of the SBLC Squib Valves based on their respective power supplies?

- A. Only one will actuate; it is powered from A RPS.
- B. Both will actuate; they are powered from Uninterruptible A.C.
- C. Both will actuate; they are powered from respective divisions of 125 VDC.
- D. Only one will actuate; it is powered from its associated pump breaker on the 480 volt MCC.

D IS CORRECT: SBLC pump 11 and explosive valve are powered from MCC-133 BKR B3301; and SBLC pump 12 and explosive valve are powered from MCC-142 BKR B4201. In this case only one will actuate because power is lost to the division 2 squib valve due to the Bus 16 LOCKOUT.

A is incorrect: The explosive valves are not powered from RPS

B is incorrect: Only one will actuate and the squib valves are not powered from UPS

C is incorrect: Only one will actuate and the squib valves are not powered from 125 VDC

REFERENCE: B.03.05-01

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 211000 SLC

K/A: K2.02 **IMPORTANCE:** RO 3.1 **COG LEVEL:** 1F

K/A DESCRIPTION: Knowledge of electrical power supplies to the following: Explosive valves

DIFFICULTY 2 **LESSON PL:** M8107L-004 **OBJECTIVE:** 4

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

34. Given the following conditions:
- Drywell pressure is 1.0 psig
 - Reactor level is 35 inches
 - "A" SBGT is isolated for maintenance and "B" SBGT is in Standby

What is the response of "B" SBGT following a loss of RPS MG Set "A"?

The "B" SBGT Train will...

- A. start immediately.
- B. start after a 10-second delay.
- C. remain in standby since RPS MG Set "B" remains available.
- D. remain in standby since a Partial Group 2 isolation signal is NOT present.

B IS CORRECT: Loss of RPS MG Set "A" will result in a loss of power to the "A" Reactor Building Ventilation Plenum and Fuel Pool Rad Monitors and the "A" trip logic relays. Loss of power results in an UPSCALE/INOP failure of these instruments. SBGT initiation is provided automatically when:

Following parameters exceed preset limits:

- 1) Reactor Building ventilation plenum high radiation, one high or two downscale trips of the two Reactor Building exhaust vent plenum monitors (RM-17-452A and RM-17-452B), or
- 2) Refueling floor radiation, one high or two downscale trips of the two refueling floor process monitors (RM-17-453A and RM-17-453B)

If "A" SBGT flow is less than 2800 CFM following a 10 second T.D. from receipt of the initiation signal, the "B" Train will automatically start.

A is incorrect: The 10 second TD must time out before SBGT starts.

C is incorrect: Although a Full GP2 is not present, SBGT will start due to the Partial GP 2 from the loss of power to the radiation monitor.

D is incorrect: SBGT will start due to the Partial GP 2 from the loss of power to the radiation monitor.

REFERENCE: B.04.02-01 **10 CFR** 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Stem and choice edits

TIER: 2 **GROUP:** 2 **CATEGORY:** 212000 RPS

K/A: K3.01 **IMPORTANCE:** RO 3.0 **COG LEVEL:** 2RI

K/A DESCRIPTION: Knowledge of the effect that a loss or malfunction of REACTOR PROTECTION SYSTEM will have on the following: Process radiation monitoring

DIFFICULTY 3 **LESSON PL:** M8107L-008 **OBJECTIVE:** 8

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

35. The plant is nearing the end of a refueling outage. The IRM13 detector drive was replaced and PMT requires the detector to be fully withdrawn and then fully inserted. Given the following conditions:

- The Reactor Mode Switch is in SHUTDOWN
- All IRMs are on Range 1 and reading 1 on 125 scale
- The SRM/IRM Drive Panel status is shown on the next page.

With the given conditions AND the SRM/IRM Drive Panel status, predict the outcome if you were to DEPRESS and HOLD the DRIVE OUT pushbutton on the SRM/IRM Drive Control Panel.

IRM 13 would....

- A. drive out until the detector is fully withdrawn.
- B. NOT drive out because the Drive In pushbutton is latched.
- C. NOT drive out because Reactor Mode Switch is in SHUTDOWN.
- D. NOT drive out because the IRM Downscale Rod Block is activated.

B IS CORRECT: The SRM-IRM Detector Drive Control Pushbuttons, 7C-S2 (Drive-In) and 7C-S3 (Drive-Out), have interlocking contacts which prevent a simultaneous Drive-In and Drive-Out signal. Since 7C-S2 is latching (doesn't need to be held in), it must be momentarily depressed again after completion of the Drive-In motion to allow 7C-S3 to function. This has NOT been depressed since the light is on. If the DRIVE OUT pushbutton was depressed, nothing would happen. Additionally, the Drive Out pushbutton must be held depressed for continued detector motion.

A is incorrect: The picture shows the drive in light on which means outward detector motion is NOT allowed until the drive in pushbutton is depressed again.

C is incorrect: The Mode switch position is commonly related to rod blocks and therefore detector withdrawal interlocks. It's a plausible misconception that Mode switch position could prevent detector withdrawal.

B is incorrect: The Mode switch position is commonly related to rod blocks and therefore detector withdrawal interlocks. It's a plausible misconception that rod blocks could prevent detector withdrawal.

REFERENCE: B.05.01.01-05

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: Picture of SRM/IRM Drive Panel status with IRM 13 selected and the Drive In light lit.

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 215003 IRM

K/A: K4.05 **IMPORTANCE:** RO 2.9 **COG LEVEL:** 3PEO/SPR

K/A DESCRIPTION: Knowledge of INTERMEDIATE RANGE MONITOR (IRM) SYSTEM design feature(s) and/or interlocks which provide for the following: Changing detector position.

DIFFICULTY 2 **LESSON PL:** M8107L-064 **OBJECTIVE:** 6

MNGP 2009 ILT NRC WRITTEN EXAM - KEY



MNGP 2009 ILT NRC WRITTEN EXAM - KEY

36. Which one of the following completes the statements below?

A leak causing a reduction in SRM detector gas pressure will cause an SRM to read _____ (1) _____. As Uranium-235 depletes in an SRM detector, it will cause the SRM to read _____ (2) _____.

- A. (1) lower
(2) lower
- B. (1) higher
(2) lower
- C. (1) lower
(2) higher
- D. (1) higher
(2) higher

A IS CORRECT: Lowering the amount of U-235 will reduce the amount of fissions that take place in the detector. Reducing the gas pressure will lower the amount of interactions taking place with fission fragments. Both of these reductions will consequently lower the indication on the SRM count rate meters.

B, C and D are incorrect: All are plausible misconceptions of proper SRM detector operation.

REFERENCE: B.05.01.01-01

10 CFR 55.41(2)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Minor choice edits

TIER: 2 **GROUP:** 1 **CATEGORY:** 215004 Source Range Monitor System

K/A: K5.01 **IMPORTANCE:** RO 2.6 **COG LEVEL:** 1F

K/A DESCRIPTION: Knowledge of the operational implications of the following concepts as they apply to SOURCE RANGE MONITOR (SRM) SYSTEM: Detector operation.

DIFFICULTY 3 **LESSON PL:** M8107L-054 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

37. The plant is operating at rated conditions when a loss of MCC-141 occurs.

Given B.05.01.02-06 Table 1, which of the following will remain ENERGIZED?

- A. RBM 8
- B. APRM 4 Page
- C. LPRM G1 Page
- D. LPRM G2 Page

D IS CORRECT: Using the table the candidate must determine that LPRM G1, APRM 4, 5 & 6 and RBM 8 have lost power. MCC-141 supplies power to the B RPS MG Set which supplies Y-40 (RPS B). Using the figure the candidate must determine which LPRM group relates to RPS B. With the choices given, only LPRM G2 will remain energized. Candidate must figure out the power supply correlations as they relate to the reference given.

A, B and C are incorrect: They are all powered by RPS B.

REFERENCE: B.05.06, B.05.01.02-06 Figure 10 **10 CFR** 55.41(6)

REFERENCE PROVIDED DURING EXAM: B.05.01.02-06 Table 1

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 215005 APRM / LPRM

K/A: K6.01 **IMPORTANCE:** RO 3.7 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Knowledge of the effect that a loss or malfunction of the following will have on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM: RPS

DIFFICULTY 3 **LESSON PL:** M8107L-066 **OBJECTIVE:** 4

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

38. The plant was operating at rated conditions when a small-break LOCA occurred along with a subsequent loss of feedwater. RCIC is in manual control and is maintaining RPV level when you observe that the RCIC suction is aligned to the Torus.

Which one of the following identifies the reason for this RCIC system alignment?

- A. The Torus is the normal suction source.
- B. High Torus water level caused an automatic transfer.
- C. The suction automatically shifted to the Torus as a result of low pump suction pressure.
- D. The suction automatically shifted to the Torus because of low Condensate Storage Tank level.

D IS CORRECT: RCIC pump suction supply will be automatically transferred to the suppression pool when the level in a condensate storage tank has dropped below a predetermined point; 2' 8" for two tank operation.

A is incorrect: The CST is the normal suction source for RCIC.

B is incorrect: RCIC suction will not transfer on +2 inches in the Torus, only HPCI does.

C is incorrect: RCIC has a low suction trip but won't transfer on low suction.

REFERENCE: B.02.03-01

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 2

GROUP: 1

CATEGORY: 217000 RCIC

K/A: A1.06

IMPORTANCE: RO 3.2

COG LEVEL: 1I

K/A DESCRIPTION: Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) controls including: Condensate storage tank level

DIFFICULTY 2

LESSON PL: M8107L-003

OBJECTIVE: 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

39. Surveillance test, 0255-08-IA-1, RCIC QUARTERLY PUMP AND VALVE TESTS, is being performed with the plant at 80% power. RCIC flow is 400 gpm when a valid RCIC initiation signal is received.

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

- (1) RCIC Test Flow valves (MO-2110 and MO-3502)
- (2) RCIC Pump Discharge valve (MO-2107)

- A. (1) automatically CLOSE when the RCIC initiation signal is received.
(2) automatically OPENS when the RCIC initiation signal is received.
- B. (1) automatically CLOSE when the RCIC initiation signal is received.
(2) remains in its normally open position.
- C. (1) automatically CLOSE when the pump discharge valves are fully open.
(2) automatically OPENS when the RCIC initiation signal is received.
- D. (1) automatically CLOSE when the RCIC initiation signal is received.
(2) automatically OPENS when the Test Flow valves are fully closed.

A IS CORRECT: Vessel low low water level auto initiation of RCIC will automatically open both pump discharge valves and close both test flow valves. MO-2107 is normally closed in a standby line up and during this surveillance test.

B is incorrect: MO-2107 would be closed during this surveillance.

C is incorrect: These valves receive a close signal upon RCIC initiation, not when the discharge valves are full open.

D is incorrect: This valve opens on the initiation signal not when the test flow valves are fully closed.

REFERENCE: B.02.03-02

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 2 **GROUP:** 1 **CATEGORY:** 217000 RCIC

K/A: A4.03 **IMPORTANCE:** RO 3.4 **COG LEVEL:** 1I

K/A DESCRIPTION: Ability to manually operate and/or monitor in the control room: System valves

DIFFICULTY 2 **LESSON PL:** M8107L-003 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

40. The plant was operating at rated conditions with HPCI Out Of Service for planned maintenance. A LOCA concurrent with a loss of both feedwater pumps occurred and conditions are as follows:

- RCIC has initiated
- RPV water level is -50 inches and stable
- RPV pressure is 600 psig and lowering slowly
- Drywell pressure is 6 psig and rising slowly
- 'A' RHR is in the Torus Spray mode

Which of the following is CORRECT for the current plant conditions?

- A. 'B' RHR can be used to MAXIMIZE Torus Spray flow.
- B. RPV water level can be RESTORED with a condensate pump.
- C. With the ADS System in AUTO, the RPV will depressurize after a time delay.
- D. The PRO can be used to OPEN the main turbine bypass valves for cooldown.

C IS CORRECT: With RPV water level below – 47 inches and a RHR pump running in the Torus cooling mode the ADS timer will have initiated and the valves may already be open. Since Alternate level control was not needed the step to inhibit ADS in C.5-1100 would not have been performed yet. In the C.5-1100 Preferred level control leg an override exists to inhibit ADS if the timer starts. This step should now be performed.

A is incorrect: Maximum torus spray flow is 300 gpm. Placing an additional division of RHR in this mode will not raise the spray flow.

B is incorrect: A condensate pump by itself would not inject with RPV pressure at 600 psig.

D is incorrect: The main turbine bypass valves would not be available because RPV water level is < -47 inches and the MSIVs would be closed.

REFERENCE: B.03.03-01, C.5.1-1100

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 218000 ADS

K/A: A2.06 **IMPORTANCE:** RO 4.2 **COG LEVEL:** 3SPK

K/A DESCRIPTION: Ability to (a) predict the impacts of the following on the AUTOMATIC DEPRESSURIZATION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: ADS initiations signals present.

ONLY part (a) of K/A is focused on. Matching the (b) portion resulted in question being a low difficulty or becoming SRO ONLY level. The first part of K/A met IAW NUREG 1021 ES-401 D.2.a paragraph 2.

DIFFICULTY 3 **LESSON PL:** M8107L-025 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

41. A plant startup is in progress with the Mode Switch in the STARTUP TO HOT STANDBY position. Given the following conditions:

- Reactor pressure is 700 psig
- MSIVs are in the OPEN position
- Condenser vacuum is 28.5 inches Hg

For the given conditions, which one of the following will **NOT** result in a reactor scram?

- A. Condenser vacuum degrades to 20" Hg Vac.
- B. A High Steam Tunnel Temperature Group I Isolation signal is received.
- C. Turbine inlet pressure rises to 850 psig AND then the Mode Switch is placed in RUN.
- D. Reactor pressure rises to 900 psig AND then a High Steam Flow Group 1 Isolation signal is received.

C IS CORRECT: Once RPV pressure raises above 840 psig the Steam Line Low Pressure (<840 psig in RUN) Group 1 isolation is bypassed.

A is incorrect: Since RPV pressure is > 600 psig the low condenser vacuum scram is active and a scram will occur.

B is incorrect: Since the Given RPV pressure is >600 psig the MSIV closure scram is no longer bypassed and a scram will occur.

D is incorrect: Going above 840 psig doesn't bypass the high steam flow Group 1 isolation. The MSIVs will go closed and since RPV pressure is > 600 psig a scram will occur.

REFERENCE: ARPs 5-B-14, 5-B-16, 5-B-37, 3-B-45

10 CFR

55.41 (5,10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 223002 PCIS/Nuclear Steam Supply Shutoff

K/A: K4.04 **IMPORTANCE:** RO 3.2 **COG LEVEL:** 1I

K/A DESCRIPTION: Knowledge of PCIS/NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM design feature(s) and or interlock(s) which provide for the following: Automatic bypassing of selected isolations during specified plant conditions.

DIFFICULTY 3 **LESSON PL:** M8107L-070 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

42. A plant transient has occurred resulting in a loss of No. 11 and No. 12 Reactor Feed Water pumps, Reactor scram, and a Group 1 Primary Containment Isolation. RCIC was operating to restore RPV water level when RCIC flow lowered to 0 gpm and the following indications were observed:

- MO-2078 (RCIC Turbine Steam Supply Valve) is OPEN.
- MO-2080 (RCIC Turbine Trip and Throttle Valve) is CLOSED.
- RCIC pump suction pressure is 20 psig.
- The Group 5 Isolation Reset light on C-04 is OFF.

Based on the above indications, what was the cause of the RCIC turbine trip?

- A. Mechanical overspeed
- B. High Reactor water level
- C. Low pump suction pressure
- D. Group 5 containment isolation

D IS CORRECT: Group 5 Isolation Reset light Off is an indication of a Group 5 isolation. Group 5 isolation will cause a turbine trip and closure of MO-2080, MO-2075 and MO-2076.

A is incorrect: This would not cause the Group 5 isolation reset light to go off.

B is incorrect: High RPV water level would cause MO-2078 to go closed, but not MO-2080 and would not cause the Group 5 isolation reset light to go off.

C is incorrect: The low suction trip occurs at 15" Hg vac. Additionally, this wouldn't cause the Group 5 Isolation Reset light to be off.

REFERENCE: B.02.03-01

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – 2002 MNGP NRC Exam – Minor stem edits

TIER: 2 **GROUP:** 1 **CATEGORY:** 223002 PCIS

K/A: A3.01 **IMPORTANCE:** RO 3.4 **COG LEVEL:** 2DR

K/A DESCRIPTION: Ability to monitor automatic operations of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF including: System indicating lights and alarms

DIFFICULTY 2 **LESSON PL:** M8107L-003 **OBJECTIVE:** 5

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

43. The following conditions exist:

- HPCI is unavailable
- The plant is being cooled down with the Main Condenser unavailable
- RHR and RHRSW flows are currently maximized in the Torus Cooling mode.
- The CRS directs the manual operation of the Safety Relief Valves (SRVs) to reduce RPV pressure.

IAW Reactor Pressure Relief Operations Manual B.03.03-05.H.1 (Manual Initiation), which one of the following is the recommended way to MANUALLY operate the SRVs, and why?

- A. Operate ONLY the one SRV with the lowest number of lifetime cycles.
- B. Alternately operate all eight SRVs to avoid overheating any one SRV pilot assembly.
- C. Alternately operate all eight SRVs to avoid overheating any localized areas of the Torus.
- D. Alternately operate ONLY the three Low-Low Set SRVs to prevent reopening an SRV with water in the tailpipe.

C IS CORRECT: The SRVs should be actuated using the preferred sequence: BASES: The preferred sequence was selected based on spreading the heat load around the Torus and to open the SRVs with the lowest number of life time cycles first.

A is incorrect: The SRV with the lowest number of lifetime cycle should be operated first, but it shouldn't be the only one operated.

B is incorrect: The preferred sequence was selected based on spreading the heat load around the Torus.

D is incorrect: Primary containment damage can occur if an SRV is re-opened too soon with an elevated water leg in the tailpipe, but these shouldn't be the only SRVs operated. A CAUTION in the procedure prevents this when performed manually. This is the automatic function of the LLSET system.

REFERENCE: B.03.03-05.H.1 **10 CFR** 55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Stem and choice edits

TIER: 2 **GROUP:** 1 **CATEGORY:** 239002 SRVs

K/A: K1.07 **IMPORTANCE:** RO 3.6 **COG LEVEL:** 1P

K/A DESCRIPTION: Knowledge of the physical connections and/or cause-effect relationships between SAFETY RELIEF VALVE SYSTEM and the following: Suppression pool

DIFFICULTY 2 **LESSON PL:** M8107L-025 **OBJECTIVE:** 9

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

44. The plant was operating at rated conditions when an inadvertent Group 1 isolation occurred. The following conditions are now present:

- RPV water level is 50 inches
- RPV pressure is 1010 psig

If a Safety Relief Valve (SRV) was manually opened for 30 seconds what would be the expected RPV water level response?

Steady state RPV water level would lower BY approximately...

- A. 3-7 inches.
- B. 8-12 inches.
- C. 13-17 inches.
- D. 18-22 inches.

B IS CORRECT: Opening a single SRV at normal reactor operating pressure will remove reactor coolant inventory at a rate equivalent to 20" reactor water level per minute. (Condition Report 99001300, Reactor Scram 108). With RPV water level at 50 inches the only injection source would be from CRD. This injection would be minimal and water level would be expected to lower approximately 10 inches.

A is incorrect: Candidate must determine from the given conditions that the only injection could be from CRD. During this 30 second time frame CRD would have no more than 1 inch affect on RPV level.

C is incorrect: Plausible misconception of RPV water level response to a manual SRV actuation.

D is incorrect: Plausible choice if the 30 second time frame is mistaken for one minute.

REFERENCE: B.03.03-05

10 CFR 55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 239002 SRVs

K/A: A4.06 **IMPORTANCE:** RO 3.9 **COG LEVEL:** 1P

K/A DESCRIPTION: Ability to manually operate and/or monitor in the control room: Reactor water level

DIFFICULTY 2 **LESSON PL:** M8107L-025 **OBJECTIVE:** 9

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

45. The Reactor is operating at rated conditions when multiple alarms are received. RPV water level is 34 inches and slowly lowering. The OATC recognizes the following indications on C-05 (See picture on the next page):

Which of the following C-05 actions must be taken FIRST for the given conditions?

- A. Depress the CV 6-12A RESET pushbutton.
- B. Place the CV 6-12A MAN/AUTO STATION in MANUAL.
- C. Place the CV 6-12B MAN/AUTO STATION in MANUAL.
- D. Place the Digital Feedwater Master Level Controller in MANUAL.

C IS CORRECT: Indications are given for a locked 'A' Feedwater Reg Valve. This requires entry into the abnormal procedure for Loss of RPV Level control. This procedure directs the operator to take manual control of the unlocked reg valve to control RPV level. The picture shows the 'A' Main Feedwater Reg. valve RESET light on, but this actually means that this Reg. valve is locked. Without stating which specific alarms are received, the candidate must recognize this as a locked FW Reg. valve and know to take manual control of the unlocked Reg. valve. This action is taken to remove DFCS and ensure the controller is in direct control of RPV water level.

A is incorrect: This action is taken later as a subsequent action and wouldn't be performed first.

B is incorrect: This will have no effect since this valve is locked up.

D is incorrect: This is not a required action as this will have no effect on the locked reg. valve.

REFERENCE: C.6-005-B-40. C.4-B.05.07.A **10 CFR** 55.41(7, 10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 259002 Reactor Water Level Control

K/A: 2.4.4 **IMPORTANCE:** RO 4.5 **COG LEVEL:** 2DR

K/A DESCRIPTION: Ability to recognize indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.

DIFFICULTY 2 **LESSON PL:** M8114L-002 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

CV 6-12A
RESET



6A-03A

CV 6-12B
RESET



6A-03B

CV 6-12A
FEEDWATER CONTROL
MAN/AUTO STATION

FEEDWATER CONT
MAN/AUTO STA A



6-84A

CV 6-12B
FEEDWATER CONTROL
MAN/AUTO STATION

FEEDWATER CONT
MAN/AUTO STA B



6-84B

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

46. The plant is operating at rated conditions when a large steam leak occurs in the Steam Jet Air Ejector room.

If the SBGT system automatically initiates, what will happen to radiation levels in the RB Exhaust Plenum Room, and why?

Radiation levels will...

- A. lower because the Turbine Building supply fans will trip.
- B. rise because the Plenum room exhaust fans take suction from the SJAE room.
- C. rise because SJAE room exhaust will be redirected to the RB Exhaust Plenum room.
- D. lower because the SBGT system will be processing the steam leak from the SJAE room.

C IS CORRECT: V-EF-26 takes suction from the air ejector room and exhausts it to the stack under normal conditions. This also is the source of stack dilution air. On a secondary containment isolation/SBGT start, V-EF-26 exhaust is re-routed to the RB exhaust plenum room. SBGT discharges to the stack acting as the dilution air. Because the contents of the steam jet air ejector room are exhausted to the plenum room, radiation levels can be expected to rise.

A is incorrect: Radiation levels will not lower.

B is incorrect: The plenum room exhaust fans will trip on a secondary containment isolation

D is incorrect: Radiation levels will rise.

REFERENCE: B.08.07-02 **10 CFR** 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 2 **GROUP:** 1 **CATEGORY:** 261000 SGTS

K/A: K1.01 **IMPORTANCE:** RO 3.4 **COG LEVEL:** 3PEO

K/A DESCRIPTION: Knowledge of the physical connections and/or cause-effect relationships between STANDBY GAS TREATMENT SYSTEM and the following: Reactor building ventilation system

DIFFICULTY 3 **LESSON PL:** M8107L-027 **OBJECTIVE:** 8

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

47. Which of the following completes the following statement?

With a NORMAL Off-site power alignment to the plant, the _____ (1) _____ transformer is normally energized via _____ (2) _____ as an emergency backup to the safety-related 4KV buses.

- A. (1) (2)
A. 1ARS 10 Bank
- B. 1AR 10 Bank
- C. 1AR 1ARS
- D. 1ARS 345 KV Bus 1

B IS CORRECT: The normal alignment of off-site power to the plant is 2R Transformer carrying plant auxiliary load, 1R Transformer energized in reserve, and 1AR Transformer energized from 10 Bank Transformer via circuit breaker 1N2 as an emergency backup to the safety-related 4KV buses.

A is incorrect: 1ARS is not normally lined up and isn't supplied by 10 Bank.

C is incorrect: 1AR is normally energized as a backup, but not from 1ARS.

D is incorrect: 1ARS is normally energized by 345 KV Bus 1 but is not the normal emergency backup.

REFERENCE: B.09.03-05

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 262001 AC Electrical Distribution

K/A: K2.01 **IMPORTANCE:** RO 3.3 **COG LEVEL:** 1F

K/A DESCRIPTION: Knowledge of electrical power supplies to the following: Off-site sources of power

DIFFICULTY 2 **LESSON PL:** M8107L-036 **OBJECTIVE:** 5

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

48. A plant startup is in progress with the Reactor Mode switch in STARTUP and all MSIVs OPEN. A fault occurs resulting in the loss of D11 (125V DC DISTRIBUTION PANEL).

If a complete loss of Y-70 (Div 1 120VAC UPS) occurs while in this condition; which of the following statements is correct.

- A. ONLY the Inboard MSIVs will isolate.
- B. ONLY the Outboard MSIVs will isolate.
- C. ALL Primary Containment Group 1 valves will isolate.
- D. ALL Primary Containment Group 1 valves will remain open.

A IS CORRECT: With a loss of D11 and Y70 all power will be lost to the Inboard MSIV solenoids and they will go closed.

B is incorrect: Outboard MSIV solenoids are powered from D21 and Y80.

C is incorrect: Group 1 valves include Inboard/Outboard MSIVs, main steam line drain valves and recirc sample valves. These will not all close for this loss.

D is incorrect: Only the inboards will close.

REFERENCE: B.02.04-05

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 262002 UPS (AC/DC)

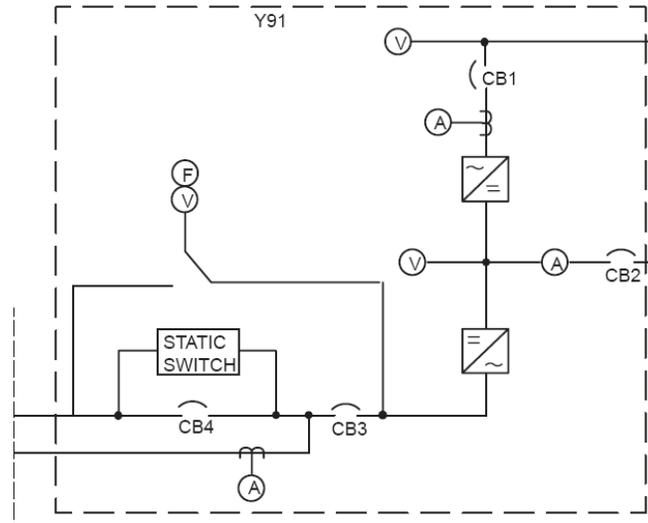
K/A: K3.11 **IMPORTANCE:** RO 2.8 **COG LEVEL:** 2RI

K/A DESCRIPTION: Knowledge of the effect that a loss or malfunction of the UNINTERRUPTABLE POWER SUPPLY (A.C/D.C.) will have on the following: MSIV's

DIFFICULTY 3 **LESSON PL:** M8114L-003 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

49. Y-91 (480 VAC UNINTERRUPTIBLE POWER SUPPLY) supplies power to Y-94 (CLASS NON-1E 480 VAC UNINT DIST PANEL). Given the internal drawing of Y-91:



If the output from the Y-91 internal inverter goes to 0 volts, which of the following describes how Y-94 will receive its power?

- A. LC-107 will automatically supply power to Y-94.
- B. LC-108 will automatically supply power to Y-94.
- C. 250 VDC Battery 17 will automatically supply power to Y-94.
- D. The Maintenance Bypass Breaker must be manually closed to power Y-94.

A IS CORRECT: In this case, the candidate must understand that the fault is resulting in a 0 volt out put to the static switch. Therefore, the static switch will automatically transfer to the alternate source (LC-107). The internal drawing is given because the candidates are not required to draw this from memory.

B is incorrect: LC-108 normally supplies power to Y-91 static inverter (via rectifiers) and Battery 17. The inverter is downstream of this and it wouldn't supply power to Y-94.

C is incorrect: The inverter will not transfer to Battery 17 because the battery uses the same input line as LC-108 to the inverter. If the inverter output is 0 volts then the battery input to the inverter will do no good.

D is incorrect: Manual transfer is not required because LC-107 will provide power.

REFERENCE: B.09.13

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 262002 UPS (AC/DC)

K/A: K6.03 **IMPORTANCE:** RO 2.7 **COG LEVEL:** 2DR

K/A DESCRIPTION: Knowledge of the effect that a loss or malfunction of the following will have on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C) SYSTEM: Static inverter

DIFFICULTY 4 **LESSON PL:** M8107L-063 **OBJECTIVE:** 3, 7, 8

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

50. Which one of the following describes a design feature of the Div I 250 VDC Electrical Distribution System battery chargers?
- A. An electrical interlock exists that prevents placing both on-line chargers in the float mode.
 - B. A mechanical interlock exists such that the standby charger can only take the place of one of the two normal chargers in the event one fails.
 - C. The standby charger supplies the battery with a float voltage of 270 volts and can directly supply the loads through a manual bypass around the battery cells.
 - D. An electrical interlock exists between the DC Output and AC Input breakers that prevents the charger from supplying the batteries until the output filters have been pre-charged from the battery.

B IS CORRECT: There is no electrical interlock only a mechanical one and the standby charger is configured such it can take the place of one of the two normal chargers in the event one fails.

A is incorrect: An electrical interlock does not exist that prevents placing both chargers in the float mode of operation.

C is incorrect: The charger cannot directly supply the loads.

D is incorrect: This is a procedural requirement not a electrical interlock.

REFERENCE: B.09.09-06

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 2 **GROUP:** 1 **CATEGORY:** 263000 DC Electrical distribution

K/A: K4.02 **IMPORTANCE:** RO 3.1 **COG LEVEL:** 1F

K/A DESCRIPTION: Knowledge of D.C ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following: Breaker interlocks, permissives, bypasses and cross ties.

DIFFICULTY 2 **LESSON PL:** M8107L-041 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

51. The plant is operating at rated conditions with #12 EDG running unloaded for routine testing.



In the picture provided, the synchroscope is rotating slowly in the clockwise direction and the BOP operator is preparing to parallel the #12 EDG with 16 Bus.

Which of the following actions should be taken and why?

- A. Lower #12 EDG output voltage to match incoming voltage; this will prevent excessive reactive currents flowing from the EDG.
- B. Raise #12 EDG output voltage to match the running voltage; this will prevent excessive reactive currents flowing into the EDG.
- C. Close the #12 EDG output breaker when the synchroscope reaches the 12 o'clock position; proper conditions are met for paralleling AC sources.
- D. Lower #12 EDG speed such that the synchroscope is rotating in the counter-clockwise direction; this will ensure the EDG picks up load when the output breaker is closed.

B IS CORRECT: In the picture shown the incoming voltage is the EDG voltage and the running voltage is 16 Bus voltage. 12 EDG voltage should be raised to match the running voltage to prevent excessive reactive current from flowing into the EDG.

A is incorrect: 12 EDG voltage is the lower voltage and it must be raised.

C is incorrect: Incoming and Running voltages should be matched for paralleling AC sources.

D is incorrect: Synchroscope rotation slowly in the clockwise direction is correct for this paralleling operation. Counter clock wise would be used when paralleling the EDG to unload it.

REFERENCE: B.09.08-05, Generic Fundamentals – Motors & Generators **10 CFR** 55.41(7, 10)

REFERENCE PROVIDED DURING EXAM: Picture of running voltage higher than edg incoming voltage

QUESTION SOURCE: New

TIER: 2 **GROUP:** 2 **CATEGORY:** 264000 EDGs

K/A: K5.05 **IMPORTANCE:** RO 3.4 **COG LEVEL:** 3SPK/SPR

K/A DESCRIPTION: Knowledge of the operational implications of the following concepts as they apply to EMERGENCY GENERATORS (DIESEL/JET): Paralleling A.C. power sources

DIFFICULTY 3 **LESSON PL:** M8120L-105 **OBJECTIVE:** 18

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

52. The plant is in Mode 4 with plans to begin startup within the next 4 hours. Given the following:

- Drywell inerting is in progress.
- Condensate Demin backwash is in progress.
- Plant breathing air is being used for rebuilding a spare CRDM.

An air leak begins that results in Instrument Air header pressure lowering to 81 psig and then stabilizes.

Based on the provided conditions, which of the following activities should be discontinued, if any, and why?

- A. CRDM rebuild activities because breathing air was lost.
- B. Inerting of the drywell because heating boiler atomizing air was lost.
- C. Condensate Demin Backwash because air for element cleaning was lost.
- D. None; these activities would NOT be impacted at the current air header pressure.

A IS CORRECT: Breathing air is provided by the service air header. This air header will automatically isolate at 82 psig and reset (open) at 95-97 psig. Candidate must know auto isolation setpoint of service air header and what this line supplies and when it auto resets. Additionally, candidate must know non-essential air isolation setpoint (80 psig) and the effect on systems from this.

B is incorrect: Heating boiler atomizing air is provided by the instrument air header. Loss of air (<80 psig) would result in a loss of the heating boiler which is required to inert the drywell (steam to the N2 Vaporizer).

C is incorrect: C.4 for loss of air requires backwashes for RWCU and Fuel Pool Cleaning and Cooling to be stopped. Air for conducting condensate Demin backwashes is provided by its own independent service air system.

D is incorrect: This would be a correct statement for the three distracters as air to these components auto isolates at 80 psig which adds plausibility to the distracters.

REFERENCE: C.4-B.08.04.01.A

10 CFR 55.41 (4)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 300000 Instrument Air

K/A: K6.04 **IMPORTANCE:** RO 2.6 **COG LEVEL:** 2RI

K/A DESCRIPTION Knowledge of the effect that a loss or malfunction of the following will have on the INSTRUMENT AIR SYSTEM: Service air refusal valve

DIFFICULTY 3 **LESSON PL:** M8114L-002 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

53. The plant is operating at rated conditions and the BOP operator has just completed transferring from 11 RBCCW Pump running to 12 RBCCW pump running. The following then occurs:
- The RBCCW Liquid Process Radiation Monitor is alarming on the C-10 Panel and has been verified to be reading greater than the alarm setpoint.
 - The RBCCW Surge Tank high level alarm is in and tank level has been verified to be greater than the alarm setpoint.

Leakage from the following systems could be the cause of the rising RBCCW Surge Tank level EXCEPT:

- A. RWCU
- B. Fuel Pool Cooling
- C. Reactor Recirc Pumps
- D. Primary Containment Drywell Coolers

D IS CORRECT: Leakage from the Primary Containment Drywell Coolers would be leakage out of the RBCCW System during normal 100% power operation. This would cause RBCCW Surge tank level to lower and would have no effect on radiation levels.

A, B and C are incorrect: All are plausible as they are cooled by RBCCW, however, leakage from these systems would all cause RBCCW surge tank level to rise.

REFERENCE: B.05.11-

10 CFR

55.41(3)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – 2002 MNGP NRC Exam

TIER: 2 **GROUP:** 1 **CATEGORY:** 400000 Component Cooling Water

K/A: A1.04 **IMPORTANCE:** RO 2.8 **COG LEVEL:** 2RI

K/A DESCRIPTION: Ability to predict and/or monitor changes in parameters associated with operating the CCWS controls including: Surge Tank Level

DIFFICULTY 2

LESSON PL: M8107L-026

OBJECTIVE: 8

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

54. Reactor power is at 15% during a plant shutdown. The OATC selects a control rod at position 24 for insertion causing a RWM Selection Error.

Predict which of the following will occur if switch 3A-S3 (ROD OUT NOTCH OVERRIDE) is placed in the EMERG ROD IN position?

The selected rod...

- A. will NOT drive in.
- B. drives in and a "Rod Drift" alarm is generated.
- C. drives in followed by the normal rod settle function.
- D. drives in and the normal rod settle function is bypassed.

A IS CORRECT: With the RWM Selection Error (SELECT BLOCK) present, the candidate must recognize that RWM INSERT and WITHDRAWAL blocks will be enforced. RWM INSERT blocks will prevent inward rod motion using the ROD IN or the EMERG ROD IN.

B is incorrect: The rod would not drive in due to the insert block but this alarm would be received.

C is incorrect: The rod would not drive in due to the insert block and the settle function is bypassed when using this switch.

D is incorrect: The rod would not drive in.

REFERENCE: B.05.05-01

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Edits to stem.

TIER: 2 **GROUP:** 2 **CATEGORY:** 201002 RMCS

K/A: A2.03 **IMPORTANCE:** RO 2.9 **COG LEVEL:** 2RI

K/A DESCRIPTION: Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Select block

ONLY part (a) of K/A met: Attempting to match the second part of the K/A resulted operationally invalid variables. Additionally, matching the second part of the K/A would conflict with a RWM malfunction used in a simulator scenario. This is the higher cog portion of this K/A, and is allowed IAW NUREG 1021 ES-401 D.2.a paragraph 2.

DIFFICULTY 4 **LESSON PL:** M8107L-001 **OBJECTIVE:** 6

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

55. The plant is in Mode 1 conducting a startup IAW C.1 (Startup) with the following conditions present:

- 4-C-03 (Recirc A Low Flow) is in ALARM
- 4-C-04 (Recirc B Low Flow) is in ALARM
- MO-2-53A (11 Recirc Pump Discharge) is full OPEN
- MO-2-53B (12 Recirc Pump Discharge) is full OPEN
- CV-6-13 (Low Flow FW Reg. Valve) is in AUTO

Based on the provided conditions, which of the following will be indicated on the RWM Display window?

- A. BELOW LPSP
- B. ABOVE LPAP
- C. TRANSITION
- D. BYPASSED

A IS CORRECT: The two alarms and the FW LFRV in service verifies reactor power is $\leq 20\%$ power. At this power level the RWM would be enforcing the withdraw sequence and the display window would show LPSP (Low Power Setpoint). The recirc discharge valve positions are provided in the conditions so the candidate can determine recirc system status as these valves in a not full open position would also cause the recirc low alarms to annunciate.

B is incorrect: This indicates reactor power is $>35\%$.

C is incorrect: This window display indicates reactor power is $> 20\%$ and less than 35% power. This is not possible with the provided conditions.

D is incorrect: Plausible distracter if the candidate determines an incorrect power level.

REFERENCE: B.05.02.02-02 page 4

10 CFR

55.43 (6, 7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2

GROUP: 2

CATEGORY: 201006 RWM

K/A: A3.01

IMPORTANCE: RO 3.2

COG LEVEL: 2DR

K/A DESCRIPTION: Ability to monitor automatic operations of the RWM including: System window and light indications.

DIFFICULTY 3

LESSON PL: M8107L-001

OBJECTIVE: 6

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

56. The plant is shutdown following a scram. Conditions are as follows:

- RPV pressure is 1000 psig.
- RWCU is being used to assist in RPV level control.
- MO-2399 (RWCU RETURN ISOL) is **CLOSED**
- MO-2400 (FILTER/DEMIN BYPASS) is **CLOSED**
- MO-2401 (RWCU DISCHARGE ORIFICE BYPASS) is **CLOSED**
- CV-2403 (RWCU DUMP FLOW) is **THROTTLED OPEN**
- MO-2404 (RWCU DUMP TO HOTWELL) is **OPEN**
- MO-2405 (RWCU DUMP TO CST/ WST) is **CLOSED**

Which of the following is correct concerning the operation of the RWCU system while draining the reactor under these conditions?

- A. MO-2401 should be OPENED to prevent possible cutting of the valve seat on CV-2403.
- B. CV-2403 must limit dump flow to 79 gpm to protect the non-regenerative heat exchanger.
- C. MO-2404 must be CLOSED to prevent contamination of the condenser hotwell.
- D. MO-2405 is allowed to be OPENED to maintain ≥ 40 gpm dump flow.

B IS CORRECT: During maximum blowdown, when all cleanup flow is routed to the condenser, no cooling water is available to the RHXs. To protect the NRHXs, cleanup system flow must be limited to 79 gpm.

A is incorrect: RWCU GPs – This valve should be closed at higher pressures to prevent unnecessary throttling and possible cutting of the MO-2403 valve seat.

C is incorrect: RWCU GPs – This is not required with MO-2400 closed

D is incorrect: Dump flow should be maintained > 40 gpm; however this valve should not be opened at the same time as MO-2404 as a loss of condenser vacuum could occur.

REFERENCE: B.02.02-05

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 2 **CATEGORY:** 204000 RWCU

K/A: A4.03 **IMPORTANCE:** RO 3.2 **COG LEVEL:** 2DR

K/A DESCRIPTION: Ability to manually operate and/or monitor in the control room: RWCU drain flow regulator

DIFFICULTY 3 **LESSON PL:** M8107L-030 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

58. The Reactor is at 225°F with all conditions stable. Reactor Water Level Control is in automatic controlling level at +25" on the Low Flow Feedwater Reg. Valve.

Given B.01.01-06 Figure 30, actual Reactor water level is....

- A. 8-11 inches.
- B. 13-16 inches.
- C. 42-45 inches.
- D. 52-55 inches.

A IS CORRECT: With all conditions stable, indicated water level will be what the Reg valve is set at. Using the figure for the given temperature actual level would be 8-11 inches

B is incorrect: Plausible for misreading the table by one line, or using 225 psig vs. 225°F.

C is incorrect: Plausible for reverse use of indicated and actual level on the table.

D is incorrect: Plausible for reverse use of indicated and actual level on the table and misreading the table by one line.

REFERENCE: B.01.01-06 Figure 30

10 CFR 55.41(2)

REFERENCE PROVIDED DURING EXAM: B.01.01-06 Figure 30

QUESTION SOURCE: ILT Bank

TIER: 2 **GROUP:** 2 **CATEGORY:** 216000 Nuclear Boiler Inst.

K/A: K1.12 **IMPORTANCE:** RO 3.6 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Knowledge of the physical connections and/or cause-effect relationships between NUCLEAR BOILER INSTRUMENTATION and the following: Reactor water level control system.

DIFFICULTY 2 **LESSON PL:** M8107L-056 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

59. The plant was operating at rated conditions when a transient occurred requiring a reactor scram. Given the following conditions:

- HPCI remains in Auto/Standby
- Drywell temperature is 138°F and rising slowly
- 8-B-14 (NO.11 4160V BUS LOCKOUT) is in alarm
- 8-C-32 (NO. 103 480V LDCTR MCC FEEDER TRIP) is in alarm

While performing your post scram actions as BOP, the Drywell Cooling Fan that is normally in Standby will NOT start.

Which of the following is a valid reason for this fan not starting?

- A. An ECCS load shed has occurred.
- B. A loss of MCC-133A has occurred.
- C. A loss of MCC-143A has occurred.
- D. An Essential Bus Transfer load shed has occurred.

B IS CORRECT: 8-C-32 (NO. 103 480V LDCTR MCC FEEDER TRIP) is an indication that a MCC has been lost off of LC-103. MCC-133A is powered from this load center. The candidate must recognize that neither of the load sheds has occurred and that the fan that is normally in standby is Drywell Fan #1 which is powered by MCC-133A. Drywell fan #3 is also lost which explains the rise in drywell temperature.

A is incorrect: 1.84 psig in the drywell would be required to cause an ECCS load shed. Temperature above 135°F will not cause an ECCS load shed. Since HPCI is in Auto/Standby, 1.84 psig has not been reached.

C is incorrect: This is the power supply for Drywell fans #2 and #4.

D is incorrect: A lockout on Bus 11 will not cause an EBT load shed.

REFERENCE: B.08.16-05

10 CFR

55.41(8)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2

GROUP: 2

CATEGORY: 223001 Primary CTMT and Aux.

K/A: K2.09

IMPORTANCE: RO 2.7

COG LEVEL: 2DR

K/A DESCRIPTION: Knowledge of electrical power supplies to the following: Drywell cooling fans

DIFFICULTY 2

LESSON PL: M8107L-044

OBJECTIVE: 4

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

60. The reactor was operating at 100% power when an event occurred that resulted in the following conditions:

- RPV pressure is 410 psig
- HPCI automatically started
- 11 & 12 Recirc system riser pressures sensed by LPCI are both 410 psig

Which of the following is correct concerning the RHR System response to the above conditions AND why?

- A. MO-2012 (RHR DIV 1 LPCI INJ OTBD) received an automatic OPEN signal due to the LPCI Loop selection logic.
- B. MO-2003 (RHR DIV 2 HX BYPASS) received an automatic CLOSE signal to prevent an inadvertent bypass of LPCI injection flow.
- C. MO-2010 (CONTAINMENT SPRAY TORUS INBOARD, LOOP A) received an automatic CLOSE signal to prevent an inadvertent bypass of LPCI injection flow.
- D. MO-4086 (RHR SUCTION EQUALIZING VALVE) received an automatic CLOSE signal to prevent an inadvertent loss of LPCI injection flow due to a broken recirc loop.

C IS CORRECT: MO-2010 receives an automatic close signal from the LPCI Initiation Logic to prevent inadvertent bypass of LPCI flow. Candidate must determine an ECCS initiation has occurred from HPCI automatically initiating. Then they must determine which LPCI loop is selected based on riser pressures. With both riser pressures equal, LPCI loop select will default to the B RHR loop but the A Torus spray valves will still receive a close signal.

A is incorrect: These valve will be on the Non-selected loop and will receive a CLOSE signal. Plausible if the candidate thinks A RHR is the default LPCI loop

B is incorrect: It will receive an automatic open signal to allow full LPCI flow around the HX.

D is incorrect: MO-4086 is a RHR to Recirc Intertie line; however this valve does not receive a closed signal.

MO-4085A and B, which are on the intertie lines, receive close signals from the LPCI Loop Select logic to prevent inadvertent loss or bypass of RHR LPCI flow.

REFERENCE: B.03.04-02 pages 7 through 12

10 CFR

55.41 (7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 2 **CATEGORY:** 230000 RHR/LPCI: Torus/Pool Spray Mode

K/A: K4.03 **IMPORTANCE:** RO 3.5 **COG LEVEL:** 2RI

K/A DESCRIPTION: Knowledge of RHR/LPCI: TORUS/POOL SPRAY MODE design feature(s) and or interlock(s) which provide for the following: Unintentional reduction in vessel injection flow during accident conditions.

DIFFICULTY 3 **LESSON PL:** M8107L-023 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

61. The plant is operating at rated conditions. Given the following for the Fuel Pool Cooling and Cleanup (FPCC) system:

- The #11 FPCC Pump and #11 FPCC Heat Exchanger are in service
- A 90 gpm leak occurs on the T-48B (12 FPCC SKIMMER SURGE TANK) outlet pipe
- NO operator action is taken

Which of the following correctly completes the statement below for the given FPCC leak?

Fuel Pool water level will...

- A. lower slightly and stabilize after T-48A (11 FPCC SKIMMER SURGE TANK) level reaches 2 feet 6 inches.
- B. lower slightly and stabilize after T-48B (12 FPCC SKIMMER SURGE TANK) level reaches 4 feet.
- C. remain unchanged because T-48B (12 FPCC SKIMMER SURGE TANK) would NOT be in service.
- D. remain unchanged because the Condensate Service system will automatically provide surge tank makeup.

A IS CORRECT: Water from the Fuel Pool overflows the weirs into the Skimmer Surge Tanks and is then pumped from the Skimmer Surge Tanks back to the pool. Since makeup to the system is manual, a leak will drain the tanks. Low Low level (2'6") in the tanks will trip the running FPCC pump. With no water being pumped to the pool, level will lower until it reaches the top of the weirs and then stabilize.

B is incorrect: Water level won't change until the FPCC pumps trip at 2' 6"

C is incorrect: Although the Low-Low level pump trip switches are both in the 11 surge tank, the surge tanks are cross-connected by an 8" tie line; if one has a leak, level will lower in both surge tanks. Fuel pool level will lower and stabilize.

D is incorrect: The Condensate Service system must manually be placed in service to provide makeup. Fuel pool level will lower and stabilize.

REFERENCE: B.02.01-01

10 CFR

55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 2 **CATEGORY:** 233000 Fuel Pool Cooling/Cleanup

K/A: K3.02 **IMPORTANCE:** RO 3.1 **COG LEVEL:** 2DR

K/A DESCRIPTION: Knowledge of the effect that a loss or malfunction of the FUEL POOL COOLING AND CLEANUP will have on the following: Fuel pool water level.

DIFFICULTY 2 **LESSON PL:** M8107L-022 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

62. The plant is operating at rated power with the following conditions:

- Main Generator Amps were 18,000
- Stator Cooling water temperature was 43°C.

A problem with the Stator Cooling Water Temperature Control Valve causes temperature to rise. At 1500 the crew entered C.4-F (Rapid Power Reduction) and the following timeline of events occurred:

Time	Stator Cooling Water Temperature (°C)	Main Generator Amps
1500	48	18,000
1501	58	17,640
1502	72	17,280
1503	87	16,500
1504	89	13,100
1505	85	10,800
1506	83	9,400

Based on the given conditions and time line, which of the following is correct?

- A. At 1502 the Speed/Load Changer is automatically ramping down.
- B. At 1503 the Speed/Load Changer is automatically ramping down.
- C. At 1504 a turbine trip signal should have been generated, a manual trip is required.
- D. At 1505 a turbine trip signal should have been generated, a manual trip is required.

B IS CORRECT: A turbine runback will be initiated if stator water temperature rises above 86°C. The runback will continue until the condition is clear or amps are less than 3720.

A is incorrect: The runback doesn't occur until 86°C. Since an alarm would be received at 48°C, amps are lowering due to operator action. This makes this distracter plausible as the candidate may think amps are lowering due to a runback.

C is incorrect: At this point a runback is in progress but a turbine trip won't occur unless current is NOT less than 13,240 amps within 2 minutes. A full 2 minutes have not elapsed and amps are < 13,240.

D is incorrect: At this point the runback is no longer in progress and a turbine trip won't occur unless current is NOT less than 13,240 amps within 2 minutes. A full 2 minutes have elapsed but amps are < 13,240.

REFERENCE: B.06.02.04-02 **10 CFR** 55.41(7, 10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2 **GROUP:** 2 **CATEGORY:** 241000 Reactor/Turbine pressure regulator.

K/A: K4.07 **IMPORTANCE:** RO 3.2 **COG LEVEL:** 3SPK

K/A DESCRIPTION: Knowledge of REACTOR/TURBINE PRESSURE REGULATING SYSTEM design feature(s) and/or interlocks which provide for the following: Generator runback.

DIFFICULTY 3 **LESSON PL:** M8107L-090 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

63. The plant is operating in Mode 1. If the HWC injection rate is raised, radiation levels will rise as much as 3 to 5 times normal on which of the following radiation monitors?
- A. RM-7858A & B (Stack WRGM Radiation Monitors)
 - B. ARM-B-5 (Feedwater Pump Area Radiation Monitor)
 - C. RM-17-251A-D (Main Steam Line Radiation Monitors)
 - D. ARM-B-3 (Condensate Demin Area Radiation Monitor)

CORRECT ANSWER: C

JUSTIFICATION: HWC General Precautions: When HWC injection rate is increased; radiation levels in the Steam Chase, Condenser Hot Side, Turbine Operating Floor, SJAE room and recombiner rooms will increase as much as 3 to 5 times normal levels. The candidate must recognize that RM-17-251A-D are in the steam chase.

A is incorrect: Minimal effects would be seen on these monitors if HWC injection is raised.

B and D are incorrect: Sufficient decay time is available for N-16 such that radiation levels wouldn't raise that much in these areas.

REFERENCE: B.02.06-05

10 CFR

55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Modified Choices

TIER: 2 **GROUP:** 2 **CATEGORY:** 272000 Radiation Monitoring System

K/A: K5.01 **IMPORTANCE:** RO 3.2 **COG LEVEL:** 1P

K/A DESCRIPTION: Knowledge of the operational implications of the following concepts as they apply to RADIATION MONITORING SYSTEM: Hydrogen injection operation's effect on process radiation indications.

DIFFICULTY 2

LESSON PL: M8107L-085

OBJECTIVE: 9

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

64. The plant was operating at rated conditions when a small break LOCA occurred. Given the following conditions:

- Reactor Building D/P is $-.20''$ H₂O
- Drywell pressure is 2.3 psig and slowly rising
- All systems responded as designed

For the given conditions, which of the following actions would improve secondary containment D/P?

- A. Manually initiate the SBTG 'A' Train.
- B. Restart the AIR EJECTOR & PIPE TUNNEL EXHAUST FAN (V-EF-26).
- C. Removing the running STEAM PACKING EXHAUSTER (K-3A/B) from service.
- D. Adjusting the variable inlet vanes of the running REACTOR BUILDING MAIN EXHAUST FAN (V-EF-24A/B) in the open direction.

C IS CORRECT: The Steam Packing Exhauster discharges to the stack and in this condition will cause backpressure which will reduce the effectiveness of the SBTG from maintaining proper D/P in secondary containment.

A is incorrect: SBTG 'A' would already be running.

B is incorrect: This fan doesn't trip when DW pressure is >1.84 psig. Additionally, if manipulating this fan were to help it would have to be tripped, not restarted.

D is incorrect: During a normal reactor building ventilation line up, adjusting the inlet dampers would improve D/P. However, this action will be ineffective as this fan will be tripped due to DW pressure >1.84 psig.

REFERENCE: C.4-B.04.01-B

10 CFR

55.41 (7and 10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 2

GROUP: 2

CATEGORY: 290001 Secondary Cont.

K/A: K6.01

IMPORTANCE: RO 3.5

COG LEVEL: 2RI

K/A DESCRIPTION: Knowledge of the effect that a loss or malfunction of the following will have on the SECONDARY CONTAINMENT: Reactor building ventilation

DIFFICULTY 4

LESSON PL: M8114L-002

OBJECTIVE: 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

65. The plant is operating at 100% power with the following conditions:

- Control Room Ventilation is in Normal Mode “A”
- Filter Train Fan V-ERF-11 Selector Switch is in AUTO LEAD

If Radiation Monitors RM-9021A/B (OUTSIDE AIR INTAKE MONITORS) are placed in the CHECK position on Panels C-257/258, which of the following correctly predicts the resultant CRV/EFT system status?

	Air Conditioner A <u>V-EAC-14A</u>	Return Air Fan A <u>V-ERF-14A</u>	11 Filter Train Fan <u>V-ERF-11</u>	Control Room Pressure to Admin/Rx Bldg ΔP
A.	Running	Running	Running	Positive
B.	Running	Running	OFF	Negative
C.	Running	Running	Running	Negative
D.	OFF	OFF	Running	Positive

A IS CORRECT: Placing these switches in the CHECK position places the system in the High Rad Mode. The fans in service prior to the manual trip would be V-EAC-14A and V-ERF-14A which would remain running and V-ERF-11 would auto start to complete the auto initiation of the high radiation mode of the EFT/CRV system. This mode would pressurize the control room.

B is incorrect: V-ERF-11 would auto start and the system is designed to maintain the control room pressurized. This would be a likely answer if the candidate does not know the system now starts on Group II signals.

C is incorrect: The system is designed to maintain the control room pressurized.

D is incorrect: The CRV/EFT system does not trip the CRV units in operation when the high radiation mode initiates.

REFERENCE: B.08.13-01 page 3 and 4, B.08.13-06 Figure 5 **10 CFR** 55.43 (7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: Significantly Modified - ILT Bank – 2007 NRC Exam (Not counted for a last two NRC Exam question due to S.M. Approved by Chief Examiner per telecom)

TIER: 2 **GROUP:** 2 **CATEGORY:** 290003 Control Room HVAC

K/A: A1.04 **IMPORTANCE:** RO 2.5 **COG LEVEL:** 2RI

K/A DESCRIPTION: Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROOM HVAC controls including: Control Room pressure

DIFFICULTY 3 **LESSON PL:** M8107L-049 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

66. You are a NPE&RO with an active license assigned to licensed duty. Today is 3/31/08 and you are standing your 5th shift as OATC for the quarter. You have already stood 7 shifts as BOP this quarter.

Due to your expertise, the CRS has requested that you assist a newly qualified Reactor Building Operator with a backwash and precoat of a RWCU F/D.

Will you satisfy the requirements to maintain your license active? Why?

- A. Yes, the requirement is to stand Five 12 hour shifts as either OATC or BOP position.
- B. Yes, as long as the assistance only requires a relief of <1 hour and you return to the OATC position.
- C. Yes, as long as the assistance only requires a relief of ≤ 4 hours and you return to the OATC position.
- D. No, being relieved to perform this assistance for any amount time would negate credit for this required OATC shift.

B IS CORRECT: OATC duties may be temporarily transferred to another licensed duty control room operator for periods of up to one hour without documentation in the control room log.

A is incorrect: Must stand five 12 hour shifts as OATC with no more that one hour of relief per shift

C is incorrect: Must be no more than an hour.

D is incorrect: A relief of one hour is allowed.

REFERENCE: OWI-01.06 / 01.08

10 CFR 55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank - 2007 NRC Exam – Modified choices

TIER: 3 **GROUP:** 2.1 **CATEGORY:** Conduct of Operations

K/A: 2.1.3 **IMPORTANCE:** RO 3.7 **COG LEVEL:** 1P

K/A DESCRIPTION: Knowledge of shift or short-term relief turnover practices

DIFFICULTY 2 **LESSON PL:** M8108L-038 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

67. The plant is operating at 70% power with the following conditions:

- Gland seal steam pressure is 11 psig
- HP turbine 1st stage pressure is 500 psig
- Turbine operating oil pressure is 240 psig
- LP Turbine exhaust hood temperatures are 160°F

What action is required to be taken?

- A. Insert a manual reactor scram and trip the main turbine.
- B. Start the Auxiliary Oil pump and verify operating oil pressure is maintained above 250 psig.
- C. Raise reactor power to raise first stage pressure at least to 700 psig for adequate bleed off steam.
- D. Control steam seal pressure at about 4 psig by closing the steam seal regulator supply valve and opening the steam seal unloading valve.

D IS CORRECT: The candidate must evaluate conditions for the given reactor power. Gland seal steam pressure is high. IF pressure is HIGH (>10 psig), THEN OPEN MO-1047, STEAM SEAL UNLOADING VALVE, to unload excess steam and control steam seal header pressure at about 4 psig.

A is incorrect: Exhaust hood temperature are not high enough to require a turbine trip. Additionally, turbine operating oil pressure is not low enough to cause a scram.

B is incorrect: The Aux Oil pump would not be started until 201 psig.

C is incorrect: Above 50% power the bleed off steam will provide the necessary sealing steam.

REFERENCE: B.06.01-05

10 CFR 55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Edits to stem

TIER: 3 **GROUP:** 2.1 **CATEGORY:** Conduct of Operations

K/A: 2.1.7 **IMPORTANCE:** RO 4.4 **COG LEVEL:** 2DR

K/A DESCRIPTION: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

DIFFICULTY 3 **LESSON PL:** M8107L-087 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

68. The plant is operating at rated conditions. Annunciator 6-C-34 (CANAL SPL PMP TRIP) has a faulty alarm card and the condition has not yet been corrected. A "WORK ORDER ISSUED" sticker has been placed on the annunciator window.

Annunciator 6-C-34 comes in alarm, the Balance Of Plant (BOP) operator announces the alarm as "expected." The alarm clears, is acknowledged and 5 minutes later is received a second time. Which of the following completes the statement for the given conditions?

The BOP operator...

- A. is NOT required to announce the second alarm.
- B. should announce the alarm as "expected" both times.
- C. should announce the second alarm as "unexpected" due to multiple activations.
- D. should have announced the alarm as "unexpected" both times due to the faulty alarm card.

B IS CORRECT: Alarms which are the result of an on-going equipment issue or condition and a Work Order has been issued for the initiating condition, SHALL be considered to be "expected" alarms and announced as such provided a "WORK ORDER ISSUED" sticker has been affixed to the associated annunciator window.

A is incorrect: The second alarm should be announced as expected.

C is incorrect: Both alarms should be announced as expected.

D is incorrect: Both alarms should be announced as expected.

REFERENCE: OWI-01.03

10 CFR

55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Minor Edits

TIER: 3 **GROUP:** 2.1 **CATEGORY:** Conduct of Operations

K/A: 2.1.17 **IMPORTANCE:** RO 3.9 **COG LEVEL:** 1P

K/A DESCRIPTION: Ability to make accurate, clear and concise verbal reports

DIFFICULTY 2 **LESSON PL:** M8108L-038 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

69. The plant has been in a maintenance outage. Plant conditions have been established to start No. 11 and No. 12 Recirc Pumps in preparation for reactor startup.

The Operator places hand switch 2A-S1A (No. 11 MG SET DRIVE MOTOR) to START and observes normal panel indication for start of the MG Set drive motor.

The Operator then places hand switch HS-2A-S7A (MO-2-53A PUMP DISCHARGE) to OPEN and holds it.

Shortly after, the following alarms are received.

- 4-C-1 (RECIRC A LOCKOUT)
- 4-C-21 (RECIRC A STARTUP SEQUENCE INCOMPLETE)
- 4-C-31 (RECIRC DRIVE MOTOR A TRIP)

Which of the following caused the trip of the No. 11 Recirc MG Set?

- A. Recirc MG Set lube oil pressure was 30 psig.
- B. Recirc MG Set lube oil temperature was 195°F.
- C. The pump D/P was only 7.2 psid after 18 seconds.
- D. The discharge valve was only 25% open after 20 seconds.

C IS CORRECT: If the pump does not develop >7.5 psid within 15 sec of placing the hand switch to start, the MG set will receive a lockout and a drive motor breaker trip. Per ARP 4-C-21, setpoint for alarm is < 7.5 PSID after drive motor handswitch in START.

A is incorrect: This is above the drive motor trip of ≤ 27 psig for a 6 second TD.

B is incorrect: Recirc MG Set lube oil temperature will cause a drive motor breaker trip if above 210°F

D is incorrect: The drive motor breaker trip is <20-25% open after a 66 second TD.

REFERENCE: B.01.04-02

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Minor Stem and Choice edits – 2002 MNGP NRC Exam

TIER: 3 **GROUP:** 2.2 **CATEGORY:** Equipment Control

K/A: 2.2.1 **IMPORTANCE:** RO 4.5 **COG LEVEL:** 1I

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

DIFFICULTY 3 **LESSON PL:** M8107L-029 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

70. Regarding the Reactor Coolant System Safety Limit, which of the following represents the most limiting maximum transient design pressure?
- A. 110% of the RPV design pressure
 - B. 120% of the RPV design pressure
 - C. 120% of the design pressure for piping communicating with RPV steam space
 - D. 120% of the design pressure for piping communicating with RPV vessel bottom

C IS CORRECT: The maximum transient pressure allowable in the RCS pressure vessel under the ASME Code, Section III, is 110% of design pressure. The maximum transient pressure allowable in the RCS piping, valves, and fittings is 120% of design pressures of 1110 psig for piping communicating with the vessel steam space and 1136 psig for piping communicating with the bottom of the vessel. The most limiting of these allowances is the 120% of the piping communicating with the vessel steam space design pressure; therefore, the SL on maximum allowable RCS pressure is established at 1332 psig as measured at the reactor steam dome.

A is incorrect: This is 110% of the RPV design pressure of 1250 psig which is 1375 psig.

B is incorrect: This is 120% of the RPV design pressure of 1250 psig which is 1500 psig.

D is incorrect: This is 120% of the design pressure for piping communicating with bottom of the RPV vessel 1136 psig which is 1363 psig.

REFERENCE: B 2.1.2

10 CFR 55.41(2)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 3 **GROUP:** 2.2 **CATEGORY:** Equipment Control

K/A: 2.2.25 **IMPORTANCE:** RO 3.2 **COG LEVEL:** 1B

K/A DESCRIPTION: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

DIFFICULTY 3 **LESSON PL:** MT-OPS-ITS-003L **OBJECTIVE:** 1

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

71. The Reactor Mode Switch is in STARTUP TO HOT STANDBY. All IRM Range Switches are on Range 3. A rod withdrawal results in the following IRM readings:

<u>IRM 11</u>	<u>IRM 12</u>	<u>IRM 13</u>	<u>IRM 14</u>	<u>IRM 15</u>	<u>IRM 16</u>	<u>IRM 17</u>	<u>IRM 18</u>
102	122	111	103	104	101	100	105

Which one of the following predicts the final status of RPS and/or RMCS if the OATC moves IRM 15 Range Switch to Range 2?

- A. A rod block ONLY
- B. A Full Scram occurs
- C. Rod Block and RPS A half scram ONLY
- D. Rod Block and RPS B half scram ONLY

B IS CORRECT: IRM 15 (RPS B) would go upscale >125 and IRM 14 (RPS A) is already tripped (ie >120), causing a Full Scram.

A is incorrect: A Half Scram has already occurred on RPS A and the action will cause Full scram.

C is incorrect: Plausible outcome if ranged in the opposite direction.

D is incorrect: A Half Scram and Rod Block will occur on RPS B but since a Half scram is already in on RPS A, a Full scram will also occur.

REFERENCE: B.05.06-02

10 CFR 55.41(7)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Edits to stem

TIER: 3 **GROUP:** 2.2 **CATEGORY:** Equipment Control

K/A: 2.2.44 **IMPORTANCE:** RO 4.2 **COG LEVEL:** 3PEO

K/A DESCRIPTION: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

DIFFICULTY 2 **LESSON PL:** M8107L-072 **OBJECTIVE:** 6

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

72. The plant is in a refueling outage. A task needs to be performed in the Drywell and the RWP indicates a job dose estimate of 58 mrem.

Which of the following approaches to performing the job will maintain the total dose within the RWP job dose estimate?

- A. One individual performing the job in a 90 mrem/hr field for 45 minutes.
- B. Two individuals performing the job in a 90 mrem/hr field for 20 minutes.
- C. One individual installing temporary shielding in a 90 mrem/hr field for 30 minutes and then performing the job in a 25 mrem/hr field for 60 minutes.
- D. Two individuals installing temporary shielding in a 90 mrem/hr field for 10 minutes and then both individuals performing the job in a 25 mrem/hr field for 30 minutes.

D IS CORRECT: Total Dose = $2 \times 15 \text{ mrem} + 2 \times 12.5 \text{ mrem} = 55 \text{ mrem}$

As part of Operations Shift briefs, the operators are required to evaluate upcoming work items and look for opportunities to reduce exposure.

A is incorrect: Total Dose = $90 \text{ mrem/hr} \times .75 = 67.5 \text{ mrem}$

B is incorrect: Total Dose = $2 \times 30 \text{ mrem} = 60 \text{ mrem}$

C is incorrect: Total Dose = $90 \text{ mrem/hr} \times .5 + 25 \text{ mrem} = 70 \text{ mrem}$

REFERENCE: 4AWI-08.04.02, 4AWI-08.04.08, GET **10 CFR** 55.41(12)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank - Significantly Modified

TIER: 3 **GROUP:** 2.3 **CATEGORY:** Radiation Control

K/A: 2.3.7 **IMPORTANCE:** RO 3.5 **COG LEVEL:** 3SPK

K/A DESCRIPTION: Ability to comply with radiation work permits during normal or abnormal conditions.

DIFFICULTY 3 **LESSON PL:** M8108L-039 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

73. Complete the following statement that correctly identifies an activity that WOULD allow Independent Verification (IV) to be waived?

Removing a Danger Tag from...

- A. B3301 (#11 SBLC Pump) while in hot shutdown.
- B. B152-503 (#13 RHR Pump) while in hot shutdown.
- C. FP-5 (FIRE SYS TEST VALVE) at rated plant conditions.
- D. RC-3-1 (11 RWCU PUMP SUCT) at rated plant conditions.

CORRECT ANSWER: D

JUSTIFICATION: Independent verifications may be waived when significant radiation, safety or other hazards exist. This valve is not safety related and is located in the RWCU Pump Room. This room is a locked high radiation area and radiation levels would be high at rated condition.

A and B are incorrect: IVs SHALL be performed when removing of a Danger tags from safety related equipment required for operability. In hot shutdown both of these pieces of equipment would be required for operability
C is incorrect: IVs SHALL be performed when removing a Danger tag from fire protection equipment.

REFERENCE: 4 AWI-04.04.02 Section 4.2.9 **10 CFR** 55.41 (12)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: New

TIER: 3 **GROUP:** 2.3 **CATEGORY:** Radiation Control

K/A: 2.3.12 **IMPORTANCE:** RO 3.2 **COG LEVEL:** 1P

K/A DESCRIPTION: Knowledge of radiation safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

DIFFICULTY 3 **LESSON PL:** M8108L-039 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

74. Which of the following requires the assigned individual(s) to be respirator qualified?

1. Serving as a Fire Brigade member
2. Manning the Control Room during a Toxic Gas event
3. Manning the ASDS Panel for Shutdown Outside the Control Room
4. Manning the Control Room during ALL Emergency Plan implementations

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

A IS CORRECT: Fire Brigade and Toxic gas events are on-shift collateral duties that require respirator qualifications

B, C and D are incorrect: 3 and 4 are not required; however they are both plausible due to some overlapping responsibilities between the four choices.

REFERENCE: OWI-01-06

10 CFR

55.41(10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank

TIER: 3 **GROUP:** 2.4 **CATEGORY:** Emergency Procedures / Plan

K/A: 2.4.12 **IMPORTANCE:** RO 4.0 **COG LEVEL:** 1P

K/A DESCRIPTION: Knowledge of general operating crew responsibilities during emergency operations

DIFFICULTY 2 **LESSON PL:** M8108L-038 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

75. The plant scrammed from 100% rated power. The following conditions exist:
- Both divisions of RPS power are unavailable.
 - On the C-05 Full Core Display, all the individual HCU blue scram lights are ON.
 - 25 control rods are at position 16, all others are full in.
 - Annunciator 5-B-21 (DISCH VOLUME WATER LEVEL SCRAM TRIP) activated moments after the scram was inserted.
 - SDV Vent and Drain valves are CLOSED.

Which one of the following Parts of C.5-3101 (ALTERNATE ROD INSERTION) would be effective for the given conditions?

- A. PART A (DE-ENERGIZE SCRAM LOGIC)
- B. PART B (DEPRESSURIZE THE SCRAM AIR HEADER)
- C. PART C (INCREASE COOLING WATER DP AND USE RMCS)
- D. PART D (RESCRAM CONTROL RODS)

C IS CORRECT: Inserting rods with RMCS will not be affected by the water in the SDV. This choice would be the most effective for the given conditions

A is incorrect: For indications given, scram logic is already de-energized.

B is incorrect: For indications given, scram air header is already depressurized.

D is incorrect: Without RPS power, re-scramming control rods is not possible.

REFERENCE: C.5-3101

10 CFR

55.41(7, 10)

REFERENCE PROVIDED DURING EXAM: None

QUESTION SOURCE: ILT Bank – Modeled after 2005 DAEC NRC Exam question – Modified stem and choices

TIER: 3 **GROUP:** 2.4 **CATEGORY:** Emergency Procedures / Plan

K/A: 2.4.31 **IMPORTANCE:** RO 4.2 **COG LEVEL:** 3SPK

K/A DESCRIPTION: Knowledge of annunciator alarms, indications, or response procedures.

DIFFICULTY 3 **LESSON PL:** M8114L-011 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

76. The plant was operating in a normal lineup at 100% power with 8N4 (Main Generator Breaker No. 1) OPEN for planned maintenance.

A disturbance occurred that resulted in the following:

- Both Circ water pumps lose power
- Both Recirc MG Sets lose power

Based on the provided conditions determine which of the following caused this event and what direction should be provided to the panel operator(s)?

- A. 8N11 (345KV GCB) tripped open, direct the BOP to enter C.4-B.06.03.A (Decreasing Condenser Vacuum).
- B. 8N11 (345KV GCB) tripped open, direct the OATC to start #11 Reactor Feed Pump per C.4-B.06.05.A (Feedwater Pump Trip).
- C. 8N12 (345KV GCB) tripped open, direct the BOP operator to enter C.4-B.06.04.A (Decreased Circulating Water Flow).
- D. 8N12 (345KV GCB) tripped open, direct the OATC to enter C.4-B.05.01.02.A (Control of Neutron Flux Oscillations).

A IS CORRECT: A 2R to 1R transfer occurred due to 8N11 tripping open. This will result in the provided conditions plus a loss of circ water pumps which will result in degrading condenser vacuum.

B is incorrect: The provided conditions will occur if 8N11 trips open. The selected C.4 is plausible as both FWPs lose power which requires entry into C.4-B.06.05.A, however, this would be an incorrect direction as 11 RFP will restart automatically when 11 bus is re-energized after the transfer.

C is incorrect: The provided conditions will not occur if 8N12 trips open. The selected C.4 is plausible as both circ water pumps will trip which requires entry into C.4-B.06.04.A. If the candidate believes the 2R to 1R transfer is caused by 8N12 tripping open with 8N4 already open.

D is incorrect: The provided conditions will not occur if 8N12 trips open. The selected C.4 is plausible as both recirc pumps are tripped which requires entry into C.4-B.05.01.02.A

REFERENCE: B.09.06-01 page 4 and 5

10 CFR 55.43 (5)

REFERENCE PROVIDED DURING EXAM: None

SRO ONLY JUSTIFICATION Directing operator performance of Abnormal Procedures

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 295003 Partial or Complete Loss of AC

K/A: AA2.01 **IMPORTANCE:** SRO 3.7 **COG LEVEL:** 2 RI

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C POWER: Cause of partial or complete loss of AC power

DIFFICULTY 3 **LESSON PL:** M8107L-036 **OBJECTIVE:** 7

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

77. The plant is operating at rated conditions when an electrical transient occurs. While the panel operators are investigating the cause you observe the following indications on the C-03 Mimic Bus (See Picture on following page).

Based on the indications, determine the extent of the electrical transient AND what Technical Specification Action is required as the CRS?

- A. **ONLY** a loss of D312 (Div 2 250V DC MCC) has occurred.
Direct the isolation of ONE penetration flow path within 4 hours.
- B. **ONLY** a loss of D312 (Div 2 250V DC MCC) has occurred.
Direct the Isolation of ONE penetration flow path within 8 hours.
- C. A loss of D313 (Div 1 250V DC MCC) **AND** D312 (Div 2 250V DC MCC) has occurred.
Direct the Isolation of ONE penetration flow path within 4 hours.
- D. A loss of D313 (Div 1 250V DC MCC) **AND** D312 (Div 2 250V DC MCC) has occurred.
Direct the Isolation of THREE penetration flow paths within 4 hours.

A IS CORRECT: The following valves are shown with no power:

MO-2035 HPCI Outboard which is powered by D312

MO-2029 RHR S/D Cooling Inboard which is AC powered and normally de-energized at power

MO-2032 RHR/Radwaste Drain Inboard which is AC powered and normally de-energized at power.

The picture only depicts a loss of power to the HPCI Outboard therefore the electrical transient has only affected ONE (HPCI) penetration flow path. This affected flow path must be isolated within 4 hours IAW TS 3.6.1.3 Condition A

B is incorrect: This is the correct transient but the 8 hour completion time only applies to MSIVs

C is incorrect: If D313 was lost, there would be no power to MO-2030.

D is incorrect: If D313 was lost, there would be no power to MO-2030. Additionally only one penetration is affected.

REFERENCE: C.4-B.09.09.A

10 CFR

55.43(2)

REFERENCE PROVIDED DURING EXAM: TS 3.6.1.3

SRO ONLY JUSTIFICATION Technical Specification ACTION & COMPLETION TIME determination.

QUESTION SOURCE: New

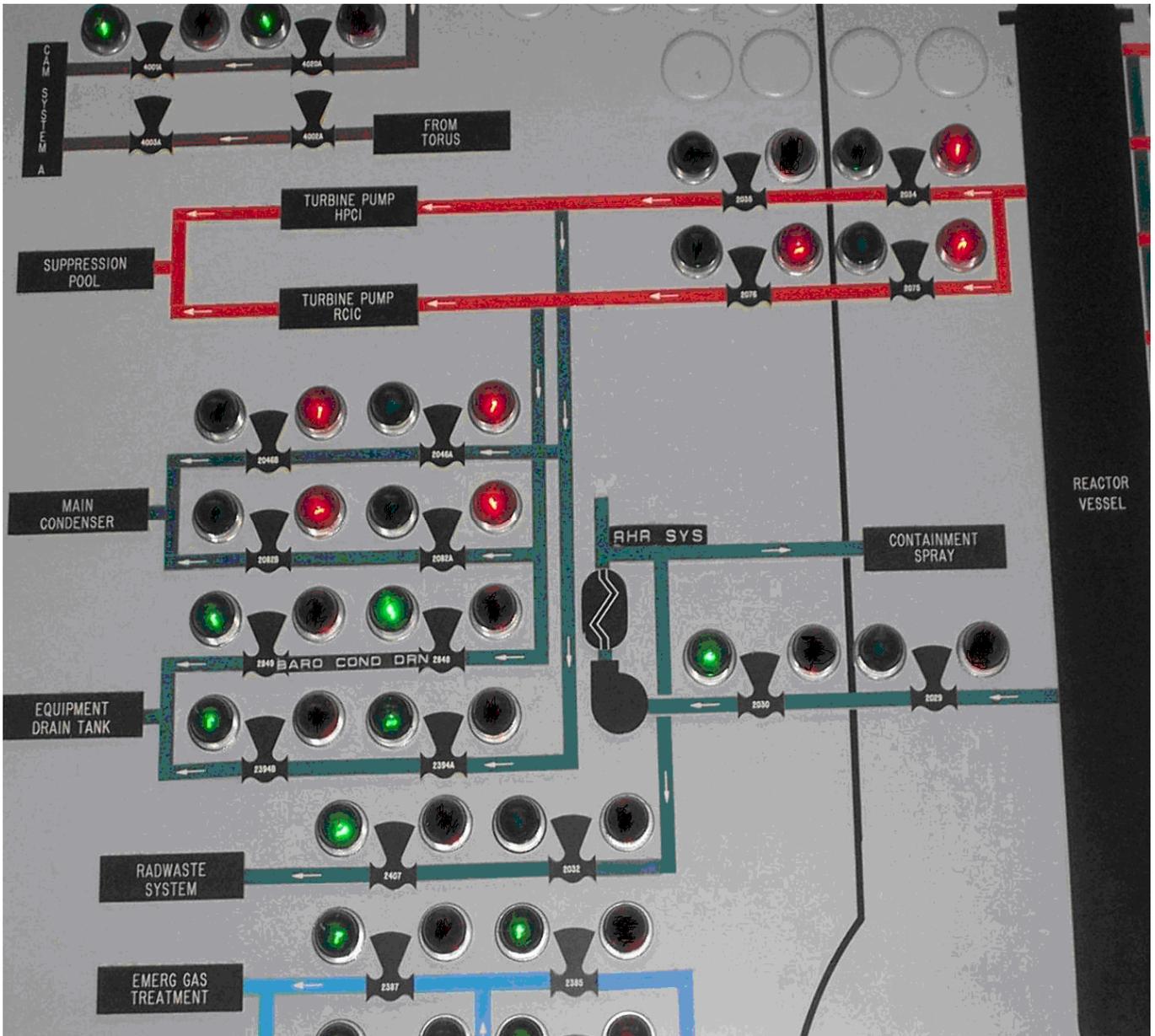
TIER: 1 **GROUP:** 1 **CATEGORY:** 295004 Partial or Total Loss of DC Pwr

K/A: AA2.02 **IMPORTANCE:** SRO 3.9 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Extent of partial or complete loss of D.C power.

DIFFICULTY 3 **LESSON PL:** M8114-003 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY



MNGP 2009 ILT NRC WRITTEN EXAM - KEY

78 The plant has been operating at rated conditions for several months.

On March 10th at 0000 it was discovered that SR 3.3.2.2.1 for the Feedwater Pump and Main Turbine High Water Level Trip Instrumentation had not been performed since March 9th at 0800. A risk assessment has NOT been performed.

Given the information above, determine if an extension is allowed, if so, when is the latest the surveillance can be completed and remain in compliance with Technical Specifications?

- A. An extension IS allowed; perform the surveillance prior to March 10th at 0800.
- B. An extension IS allowed; perform the surveillance prior to March 10th at 1200.
- C. An extension IS allowed; perform the surveillance prior to March 11th at 0000.
- D. An extension IS NOT allowed; immediately enter the ACTIONS of TS 3.3.2.2.

C IS CORRECT: SR 3.3.2.2.1 has a 12 hour frequency with a 1.25 times grace period which would require the SR to have been performed by 2300 on March 9th. SR 3.0.3 allows from time of discovery, 24 hours or the length of the specified frequency which ever is greater to perform the surveillance. Note: 24 hours can only be exceeded if a risk evaluation has been performed.

A is incorrect: Plausible for using the 24 hour allowance from the last time the SR was performed.

B is incorrect: Plausible for 12 hours from time of discovery or thinking the 24 hour allowance can't be used without a risk assessment.

D is incorrect: SR 3.0.3 allows delay of entering actions.

REFERENCE: SR 3.03 & T.S. 3.3.2.2

10 CFR

55.43 (2)

REFERENCE PROVIDED DURING EXAM: SR 3.03 & T.S. 3.3.2.2

SRO ONLY JUSTIFICATION Technical Specification Surveillance Requirement extension determination.

QUESTION SOURCE: New

TIER: 1 **GROUP:** 1 **CATEGORY:** 295005 Main Turbine Generator Trip

K/A: 2.2.40 **IMPORTANCE:** SRO 4.7 **COG LEVEL:** 3SPK/SPR

K/A DESCRIPTION: Ability to apply Technical Specifications for a system

DIFFICULTY 4 **LESSON PL:** M8107L-013 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

79. The plant is in a refueling outage with the following conditions present:

- The RPV head is removed
- RPV water level is two feet above the reactor vessel flange
- 1027' elevation radiation levels are 2 mrem/hr
- Secondary containment is NOT established

A leak occurs in the East Shutdown Cooling room and plant conditions changed as follows:

- RPV water level lowered BY 224 inches
- 1027' elevation radiation levels rose to 18 mrem/hr
- 14 minutes after the start of the leak, it was isolated and RPV water level was restored to the flange

Using B.01.01-06 Figure 28, which of the following E-plan classifications, if any, should be declared?

- A. NUE
- B. ALERT
- C. Site Area Emergency
- D. No classification required

A IS CORRECT: Lowering water level by 224 inches results in indicated level lowering to approximately -25". This would meet the requirement of RU2.1.

B is incorrect: Rising radiation levels on the 1027 elevation to 20 mrem meets the requirements of RA2.1, not 18mr.

C is incorrect: Plausible but water level has not gone below – 53".

D is incorrect: Plausible if Hot EALs are used or if CU2.1 is used and less than 15 minutes is not recognized.

REFERENCE: B.01.01-06 figure 28, EAL Matrix **10 CFR** 55.43 (7)

REFERENCE PROVIDED DURING EXAM: B.01.01-06 figure 28, EAL Matrix

SRO ONLY JUSTIFICATION E-PLAN EAL Determination

QUESTION SOURCE: ILT Bank

TIER: 1 **GROUP:** 1 **CATEGORY:** 295023 Refueling Acc

K/A: AA2.05 **IMPORTANCE:** SRO 4.6 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS:
Entry conditions of emergency plan.

DIFFICULTY 3 **LESSON PL:** M7415L-007 **OBJECTIVE:** 1

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

80. EOPs 1100 and 1200 were entered due to a steam leak inside Primary Containment. The following conditions exist:
- Torus Sprays are in service
 - Drywell pressure is 5 psig and rising
 - Drywell temperature is 278°F and rising
 - Torus pressure is 4 psig and rising
 - Torus level is 1.2 feet

As the CRS, which of the following identifies the correct action to direct and why?

Drywell Sprays ...

- A. shall be initiated to prevent excessive temperatures inside the Primary Containment.
- B. shall be initiated to prevent chugging in the downcomers which could cause Primary Containment damage.
- C. shall NOT be initiated because this could result in Drywell Pressure negative enough to challenge the Primary Containment.
- D. shall NOT be initiated because this will cause chugging in the downcomers which could cause Primary Containment damage.

C IS CORRECT: Unrestricted operation of DW sprays could result in a negative Drywell Pressure large enough to challenge the Primary Containment

A and B are incorrect: Drywell sprays should not be initiated due to being in the DO NOT SPRAY portion of the D/W Spray Limit Curve.

D is incorrect: Correct action, but in this case is not the reason Drywell sprays would not be initiated.

REFERENCE: C.5.1-1000 bases, D/W Spray Limit Curve **10 CFR** 55.43 (5)

REFERENCE PROVIDED DURING EXAM: EOP Flow Charts

SRO ONLY JUSTIFICATION EOP Flowchart navigation and action determination.

QUESTION SOURCE: ILT Bank

TIER: 1 **GROUP:** 1 **CATEGORY:** 295024 High Drywell Pressure

K/A: EA2.01 **IMPORTANCE:** SRO 4.4 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to High Drywell Pressure:
Drywell pressure

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

81. The reactor was operating at 30% power. I&C technicians were performing calibration testing on the Group 1 isolation logic and inadvertently caused a Group 1 isolation. Reactor pressure peaked at 1052 psig.

Given 4AWI-04.08.02 Figures 5.1-5.3 and 10CFR50.72; which of the following is the most restrictive 10CFR50.72 notification required, if any?

- A. 1 hour
- B. 4 hour
- C. 8 hour
- D. None required

B IS CORRECT: With the Group 1 isolation a reactor scram will have occurred. This a 4 hour notification IAW 50.72(b)(2)(iv)(B).

A is incorrect: Entry into E plan is not required and a deviation of plant Technical Specifications has not occurred

C is incorrect: These conditions fall under the 8 hour notification, however the RPS actuation is more restrictive.

D is incorrect: Plausible if candidate doesn't realize a RPS trip still occurs even though reactor pressure only reached 1052 psig (scram set point is 1056 psig).

REFERENCE: 4AWI-04.08.02 Figure 5.2, NUREG 1022, **10 CFR** 55.43 (5)
10CFR50.72

REFERENCE PROVIDED DURING EXAM: 4AWI-04.08.02 Figures 5.1-5.3, 10CFR50.72 and a single copy of NUREG 1022 in the examination room for reference if requested.

SRO ONLY JUSTIFICATION Immediate notification requirements.

QUESTION SOURCE: ILT Bank – Minor Edits to stem

TIER: 1 **GROUP:** 1 **CATEGORY:** 295025 High Reactor Pressure

K/A: 2.4.30 **IMPORTANCE:** SRO 4.1 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Knowledge of events related to system operation / status that must be reported to internal organization or external agencies, such as the state, NRC, or the transmission system operator.

DIFFICULTY 2 **LESSON PL:** M8108L-039 **OBJECTIVE:** 1

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

82. Given the following sets of parameters:

Case 1)	Torus Average Water Temperature, stable at	180°F
	RPV Pressure, stable at	800 psig
	Drywell Pressure, stable at	10 psig
	Torus Water Level, stable at	-3 ft
Case 2)	Torus Average Water Temperature, stable at	170°F
	RPV Pressure, stable at	500 psig
	Drywell Pressure, stable at	14 psig
	Torus Water Level, stable at	-2 ft

Is Emergency Depressurization (BLOWDOWN) required in each of these cases?
(Assume operator actions to restore and maintain the above parameters have NOT been successful.)

- A. Case 1) BLOWDOWN NOT required.
Case 2) BLOWDOWN NOT required.
- B. Case 1) BLOWDOWN NOT required.
Case 2) BLOWDOWN required.
- C. Case 1) BLOWDOWN required.
Case 2) BLOWDOWN NOT required.
- D. Case 1) BLOWDOWN required.
Case 2) BLOWDOWN required.

C IS CORRECT: Case 1 requires an ED due to exceeding figure M (Heat Capacity Limit). Case 2 doesn't require an ED as these parameters are within Figure M and Figure O (Pressure Suppression Pressure).

A, B and D are incorrect: Plausible distracters for incorrect application of the EOP flow charts.

REFERENCE: C.5.1-1200, EOP Flow Charts **10 CFR** 55.43 (5)

REFERENCE PROVIDED DURING EXAM: EOP Flow Charts

SRO ONLY JUSTIFICATION EOP Flowchart navigation and action determination.

QUESTION SOURCE: Significantly Modified – ILT-Bank – DAEC 2001 NRC SRO Exam

TIER: 1 **GROUP:** 1 **CATEGORY:** 295026 Suppression Pool High Water Temp

K/A: 2.1.20 **IMPORTANCE:** SRO 4.6 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to interpret and execute procedure steps

DIFFICULTY 2 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

83. A Reactor startup is in progress with the RWM out of service. A second licensed operator is present at C-05 to verify the movement of control rods. The following conditions apply:

- RWM bypassed
- Reactor Power at 5×10^3 cps on the SRMs

Due to an administrative error with the Reactivity Maneuvering Steps, several Control Rods have been withdrawn that are inconsistent with the Banked Position Withdrawal Sequence (BPWS).

If a control rod drop accident occurs under these conditions, which of the following limits may be exceeded?

- A. PCIUTL
- B. Peak Fuel Enthalpy
- C. Reactor Vessel Pressure
- D. Minimum Critical Power Ratio

B IS CORRECT: The stem of the question indicates that several rod withdrawal errors have occurred as a result of an administrative error while operating with the RWM bypassed. As a result of multiple rods out of position (not in compliance with the Rod Pattern Control/BPWS), TS 3.1.6 Bases (Applicable Safety Analysis) states that the basis for the RPC/BPWS is limiting "peak fuel enthalpy" to less than 280 cal per gram.

A is incorrect: PCIUTL is only used above the threshold power level (approximately 80% RTP).

C is incorrect: The reactor is operating in the Source Range, and IRM scram will terminate power rise before reaching point of adding heat.

D is incorrect: (MCPR) is not correct because the MCPR LCO (3.2.2) is not applicable until above 25% power.

REFERENCE: TS 3.1.6 Bases **10 CFR** 55.43 (6)

REFERENCE PROVIDED DURING EXAM: None

SRO ONLY JUSTIFICATION Knowledge of TS Bases (NON-Safety Limit)

QUESTION SOURCE: LOR Bank

TIER: 1 **GROUP:** 2 **CATEGORY:** 295014 Inadvertent Reactivity Addition

K/A: AA2.04 **IMPORTANCE:** SRO 4.4 **COG LEVEL:** 1B

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION: Violation of fuel thermal limits

DIFFICULTY 3 **LESSON PL:** M8107L-001 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

84. An event has occurred that has resulted in the following conditions:

- A Radioactive release is in progress
- General Emergency has been declared
- Field teams report wind directly from the East
- Severe weather is NOT predicted in the forecast
- The MET tower is out of service and backup MET data is unavailable

Given 5790-102-02 pg. 2 and the above conditions, determine wind direction and the initial Protective Action Recommendations?

Wind direction FROM (1) degrees.
 Evacuate (2) sectors out to 2 miles.
 Evacuate (3) sectors out to 5 miles
 Evacuate (4) sectors out to 10 miles.

	<u>(1)</u> <u>Wind From</u>	<u>(2)</u> <u>2 miles</u>	<u>(3)</u> <u>5 miles</u>	<u>(4)</u> <u>10 miles</u>
A.	270	D, E, F	5N, 5E, 5S	10E, 10SE
B.	90	M, N, P	5W	10SW, 10W, 10NW
C.	90	All	5W	None
D.	270	All	5N, 5E, 5S	None

C IS CORRECT: Wind is from 90°. This will require all sectors within 2 miles evacuated and the 5W sector evacuated. The 10-mile sectors are based on dose projection and are only evacuated with state recommendation.

A is incorrect: Wrong wind direction, all 2-mile sectors should be evacuated, and 10-mile evacuation not required

B is incorrect: All 2 mile sectors required and 10-mile evacuation not required

D is incorrect: This would be correct if 270° used for wind direction

REFERENCE: A.2-204, 5790-102-02 **10 CFR** 55.43 (4)

REFERENCE PROVIDED DURING EXAM: 5790-102-02 pg. 2 of 3

SRO ONLY JUSTIFICATION Protective Action Recommendations

QUESTION SOURCE: Significantly Modified - 2007 SRO NRC Retake exam (Not counted for a last two NRC Exam question due to S.M. Approved by Chief Examiner per telecom)

TIER: 1 **GROUP:** 2 **CATEGORY:** 295017 High Off-site Release Rate

K/A: AA2.05 **IMPORTANCE:** SRO 3.8 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Meteorological data

DIFFICULTY 2 **LESSON PL:** M7406L-002 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

85. The plant was operating at rated conditions when an ATWS event with fuel damage occurred. Actuation of the ATWS pushbuttons was successful and all control rods are fully inserted. The following conditions are now present:

- RPV water level is +20 inches and stable
- RPV pressure is being maintained by the EPR
- Steam Chase radiation levels are 7000 mrem/hr
- East CRD HCU Area radiation levels are 800 mrem/hr
- West CRD HCU Area radiation levels are 1025 mrem/hr
- Containment radiation levels are 30 R/hr
- Stack Effluent Monitors are reading 1.91E7 $\mu\text{Ci}/\text{sec}$.
- All Reactor Building Area temperatures are normal

For the above conditions, which of the following actions must be directed by the CRS?

- A. Close MSIVs
- B. Open 3 ADS valves
- C. Declare a Site Area Emergency
- D. Declare a General Emergency

A IS CORRECT: IAW C.5-1400: Isolate all primary systems discharging outside primary and secondary containment. For these conditions the only way to satisfy this requirement would be to close MSIVs

B is incorrect. This is not required because closing the MSIVs can isolate this particular discharge.

C is incorrect. For the ATWS an alert would be declared.

D is incorrect. The given conditions have not escalated to this level

REFERENCE: C.5.1-1300/1400, A2.101, EOP Flow Charts **10 CFR** 55.43(4)

REFERENCE PROVIDED DURING EXAM: EOP Flowcharts, EAL Matrix

SRO ONLY JUSTIFICATION EOP Flowchart navigation and action determination.

QUESTION SOURCE: ILT Bank

TIER: 1 **GROUP:** 2 **CATEGORY:** 295033 High Secondary Containment Area Radiation Levels.

K/A: 2.4.21 **IMPORTANCE:** SRO 4.6 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

86. A normal plant Shutdown/Cooldown is in progress with the following conditions:

- RPV pressure is 45 psig
- No Surveillances are in progress
- Both Reactor Recirc Pumps are OFF
- #12 RHR pump is tagged out for new breaker installation
- #13 RHR and #13 RHRSW pumps are in the Shutdown Cooling Mode and are capable of being realigned for LPCI injection

It has been determined that the Service Water piping supplying motor cooling to the Division 1 AND Division 2 ECCS pumps is completely plugged due to silt buildup. The System Engineer estimates it will take 48 hours to clear the piping.

Which of the following is the correct action to be taken in regards to the Shutdown Cooling System and Technical Specifications?

- A. Continue the plant cooldown with #13 RHR pump.
Technical Specification Actions for Shutdown Cooling are NOT required.
- B. Continue the plant cooldown with #11 RHR pump.
Immediately take action to restore #12 RHR pump to operable status AND verify one alternate method of decay heat removal within 1 hour AND be in Mode 4 within 24 hours.
- C. Continue the plant cooldown with #11 RHR pump.
Immediately take action to restore a Recirc pump to operation AND verify an alternate method of reactor coolant circulation within 1 hour AND monitor reactor coolant temperature and pressure Once per hour.
- D. Stop the plant cooldown; all RHR pumps are inoperable.
Immediately take action to restore a Recirc pump to operation AND verify an alternate method of reactor coolant circulation within 1 hour AND monitor reactor coolant temperature and pressure Once per hour.

B IS CORRECT: With the given conditions, only #11 RHR pump is operable. With the loss of service water motor cooling only #13 and 14 RHR pump becomes inoperable. #12 RHR pump is inoperable with a new breaker being installed. Shutdown cooling should be shifted to #11 RHR pump and TS require two RHR pumps to be operable in Mode 3 or enter TS 3.4.7 Condition A.

A is incorrect: #13 RHR pump is inoperable due to a loss of SW motor cooling and TS 3.4.7 Condition A is required.

C is incorrect: TS 3.4.7 Condition A is required Not Condition B. Additionally, 2 hours is allowed for swapping.

D is incorrect: # 11 RHR pump is still available and TS 3.4.7 Condition B is not required to be entered.

REFERENCE: B.03.04-02 & 05, TS 3.4.7

10 CFR 55.43 (2)

REFERENCE PROVIDED DURING EXAM: TS 3.4.7

SRO ONLY JUSTIFICATION Technical Specification ACTION & COMPLETION TIME determination.

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 205000 Shutdown Cooling

K/A: A2.07 **IMPORTANCE:** SRO 2.7 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to (a) predicts the impacts of the following on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of motor cooling

DIFFICULTY 3 **LESSON PL:** M8107L-023 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

87. The plant is operating at 60% power. At 1100 you are performing your Shift Supervision completion review of a surveillance that documents the AS LEFT trip settings for the Turbine Control Valve Fast Closure instruments. Trip settings are as follows:

- PS-7110: 166.4 psig
- PS-7111: 167.4 psig
- PS-7112: 168.7 psig
- PS-7113: 167.9 psig

Given NX-7834-67-7 & 8; which one of the following actions is required, and if performed, will prevent a Technical Specification violation?

- A. Restore RPS trip capability by 1200.
- B. Place either RPS channel in trip by 1700
- C. Place RPS Channel A in trip by 2300.
- D. Place RPS Channel B in trip by 2300.

A IS CORRECT: RPS A (PS-7112 & PS-7113); RPS B (PS-7110 & PS-7111). All pressure switches are required to be operable (≥ 167.8 psig) when $\geq 45\%$ RTP. With the given conditions both channels in RPS B trip system are inoperable which makes the function lost. This will require entry into TS 3.3.1.1 conditions A and C. Choice A represents condition C and its required action. If this action is not taken first by 1200 compliance with TS will not be maintained.

B is incorrect: Plausible action to take if the switches are not recognized to both be on RPS B

C is incorrect: Plausible action to take if candidate does not recognize the loss of RPS trip capability and incorrectly identifies A and B pressure switches.

D is incorrect: This action is required but compliance will not be maintained if this only was performed because RPS trip capability is lost.

REFERENCE: TS 3.3.1.1, NX-7834-67-7 & 8

10 CFR 55.43 (2)

REFERENCE PROVIDED DURING EXAM: TS 3.3.1.1, NX-7834-67-7 & 8

SRO ONLY JUSTIFICATION Technical Specification ACTION & COMPLETION TIME determination.

QUESTION SOURCE: ILT Bank – 2007 SRO Retake Audit Exam

TIER: 2 **GROUP:** 1 **CATEGORY:** 212000 RPS

K/A: 2.1.7 **IMPORTANCE:** SRO 4.7 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior and instrument interpretation.

DIFFICULTY 3 **LESSON PL:** M8107L-072 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

88. The plant is operating in Mode 1. The cubicle door latch on the MCC-311 breaker for the RCIC condenser vacuum pump is being replaced IAW an approved work order. The work is expected to take six hours including post maintenance testing. The breaker will remain closed throughout the activity.

Based on this information, which of the following allows for the maximum completion time and must be performed to remain in compliance with Technical Specifications?

- A. Immediately declare RCIC inoperable.
- B. Close and deactivate MO-2075 (RCIC STEAM SUPPLY ISO. VALVE) within 1 hour.
- C. Close and deactivate MO-2075 (RCIC STEAM SUPPLY ISO. VALVE) within 4 hours.
- D. Close and deactivate MO-2075 (RCIC STEAM SUPPLY ISO. VALVE) within 72 hours.

C IS CORRECT: While the Reactor water temperature is above 212 degrees F, the steam line to the RCIC room must be isolated at either MO-2075 or MO-2076 for any activity which opens the enclosure of MCC-311 to the RCIC room environment. If MO-2075 and MO-2076 are in the open position, and the MCC enclosure of MCC-311 is opened to the RCIC room environment, then enter the applicable Condition of Tech Spec 3.6.1.3.

A is incorrect. TS entry would not be required until after MO-2075 or MO-2076 is shut. This is not immediately required because 4 hours is allowed before one of the valves has to be closed.

B and D are incorrect. One of the two primary containment isolation valves has to be closed within 4 hours. 1 hour is plausible for multiple penetrations and 72 hours is plausible for penetrations with one PCIV.

:

REFERENCE: B.09.09-05, TS 3.6.1.3 **10 CFR** 55.43 (2)

REFERENCE PROVIDED DURING EXAM: TS 3.6.1.3

SRO ONLY JUSTIFICATION Technical Specification ACTION & COMPLETION TIME determination.

QUESTION SOURCE: ILT Bank

TIER: 2 **GROUP:** 1 **CATEGORY:** 217000 RCIC

K/A: 2.2.36 **IMPORTANCE:** 4.2 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to determine the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

DIFFICULTY 3 **LESSON PL:** M8107L-041 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

89. The plant was operating at rated conditions when an un-isolable steam line break occurred in the Drywell. C.5-3503 (DEFEAT DRYWELL COOLER TRIPS) actions have been completed. C.5-3502 (CONTAINMENT SPRAY) Drywell Spray actions have been unsuccessful. Conditions are now as follows:

- Drywell pressure is 11 psig
- Drywell temperature is 296°F
- Torus water level is +6 inches

Which of the following EOP actions must be directed by the CRS at this time, and why?

- A. Open the ADS valves because Pressure Suppression Pressure is being exceeded.
- B. Restart drywell cooling fans in an attempt to lower drywell temperature prior to performing a Blowdown.
- C. Open the ADS valves because drywell temperature cannot be restored and maintained below 281°F.
- D. Perform a Blowdown but do NOT use the ADS valves because the ADS qualification temperature has been exceeded.

C IS CORRECT: Based on the above conditions the CRS should be focused on the Drywell Temperature Leg of the EOPs. Without sprays, Drywell temperature cannot be restored and maintained below 281°F which requires a Blowdown.

A is incorrect: Plausible action without Drywell sprays if the CRS is only focused on the Drywell Pressure Leg of the EOPs. Pressure Suppression Pressure (Figure O) is still being maintained but it is plausible to misinterpret the graph.

B is incorrect: It is plausible to assume the CRS may attempt to lower temperature to less than 281°F prior to Blowdown, but this would be an incorrect action as it should have already been attempted.

D is incorrect: The qualification temperature (335°F) has not been exceeded yet, the ADS valve should be used IAW C.5-2002.

REFERENCE: C.5.1-1200, C.5-1200 Flow Chart **10 CFR** 55.43 (5)

REFERENCE PROVIDED DURING EXAM: EOP Flow Charts

SRO ONLY JUSTIFICATION EOP Flowchart navigation and action determination.

QUESTION SOURCE: New

TIER: 2 **GROUP:** 1 **CATEGORY:** 218000 ADS

K/A: A2.01 **IMPORTANCE:** SRO 4.3 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to (a) predicts the impacts of the following on the AUTOMATIC DEPRESSURIZATION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Small steam line break LOCA.

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

90. A Loss of ALL Off-Site power occurred and the following information has just been given to you by the panel operators:

- Reactor power is >3%
- SBLC Tank level is 990 gallons and lowering
- RPV pressure is 915 psig and rising
- RCIC is injecting, RPV level is –100 inches and lowering
- Torus Temperature is 125°F and rising slowly
- Torus water level is 5 inches
- 11 EDG failed to start

Based on the above information, which of the following EOP actions would you implement at this time?

- A. Maintain RPV pressure between 900 -1056 psig using Low-Low Set.
- B. Maintain RPV pressure 800-1000 psig using the main turbine bypass valves.
- C. Anticipate Emergency Depressurization, O.K. to exceed 100°F/hour cooldown.
- D. Initiate a cooldown until RPV pressure is <75 psig, do NOT to exceed 97°F per hour.

A IS CORRECT: With 11 EDG failing to start concurrent with a Loss of ALL off-site power, the turbine bypass valves would be unavailable. The candidate must predict the effects of the Loss of ALL Off-Site Power on the AC distribution system with 11 EDG failing to start. Pressure should be stabilized below 1056 psig in this case using LL SET 900-1056 psig.

B is incorrect: With a Loss of ALL Off-Site power and 11 EDG failing to start power would be unavailable to Bus 15 which would prevent the use of the bypass valves.

C is incorrect: ED should not be anticipated during this ATWS because there is plenty of margin to the Heat Capacity limit and cold shutdown boron has not yet been injected.

D is incorrect: Cold shutdown boron has not yet been injected. Additionally, lowering pressure in this ATWS condition is undesirable because Cold Shutdown Boron Weight has not been injected.

REFERENCE: EOP-1200, EOP-2007

10 CFR 55.43 (5)

REFERENCE PROVIDED DURING EXAM: EOP Flow Charts

SRO ONLY JUSTIFICATION EOP Flowchart navigation and action determination.

QUESTION SOURCE: LOR Bank – Minor Edits

TIER: 2 **GROUP:** 1 **CATEGORY:** 262001 AC Electrical Distribution

K/A: A2.03 **IMPORTANCE:** SRO 4.3 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to (a) predicts the impacts of the following on the AC ELECTRICAL DISTRIBUTION; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of Off-site power

DIFFICULTY 3 **LESSON PL:** M8114L-003 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

91. The plant was operating at 50% power with #12 Circulating Water Pump isolated for required maintenance. The following events occur:

- LOCKOUT on Bus 13
- LC-107 fails to re-energize
- The reactor has scrammed
- Ten control rods are at position 48
- IRMs are reading 75 on range 6 and lowering
- 4-C-05 (FLUID DRIVE A SCOOP TUBE LOCK) is in alarm
- 4-C-10 (FLUID DRIVE B SCOOP TUBE LOCK) is in alarm

As the CRS, which of the following actions is required to be directed?

- A Trip both recirc pumps IAW C.4-A (REACTOR SCRAM).
- B Trip both recirc pumps IAW C.5-2007 (FAILURE TO SCRAM).
- C Defeat the Low-Low RPV water level isolation for MSIV closure.
- D Manually open enough SRVs and lower RPV pressure to 930 psig.

A IS CORRECT: With no power on LC-107, MCC-114 will be de-energized and a scoop tube lock will have occurred and the recirc pumps will not runback. C.5-2007 directs the CRS to leave the power leg (reactor is not critical) and enter C.4-A. IAW C.4-A (Reactor Scram), if the recirc pumps do not runback they should be tripped.

B is incorrect: For the given ATWS condition, the reactor is not critical. C.5-2007 (Failure to Scram) requires the power leg to be exited and enter C.4-A

C is incorrect: This action cannot be performed because the condenser is not available due to loss of both circulating pumps (#12 isolated and #11 powered from bus 13).

D is incorrect: For the given conditions reactor power is not sufficient to cause rapid SRV cycling.

REFERENCE: C.5.1-2007, C.5-2007, C.4-A, and C.4-B.09.07.E **10 CFR** 55.43 (5)

REFERENCE PROVIDED DURING EXAM: EOP Flow Charts

QUESTION SOURCE: ILT Bank – 2007 SRO Retake NRC Exam – Stem edits.

TIER: 2 **GROUP:** 2 **CATEGORY:** 202002 Recirc Flow Control

K/A: A2.02 **IMPORTANCE:** SRO 3.0 **COG LEVEL:** 3 PEO

K/A DESCRIPTION: Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM and (b) based on those predictions use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations. Loss of A.C.

DIFFICULTY 2 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

92. The plant was operating at 1550 MWt. Given the following conditions:

- The EPR Control Position is set at 904 PSI
- The MPR Handwheel Position indicates 910 PSI

A failure results in the EPR servo position going fully downscale. Plant conditions have stabilized and power is 1552 MWt. Answer the following questions for the given conditions.

- (1) What action, if any, must be directed for NOT having a backup regulator available?
- (2) Would the plant be in an ANALYZED or UNANALYZED condition if the MPR relay piston position then failed fully downscale?

- A. (1) No action is required at this time.
(2) ANALYZED.
- B. (1) Reduce thermal power to < 25% within 6 hours.
(2) UNANALYZED.
- C. (1) Direct the BOP to push the EPR STOP pushbutton.
(2) ANALYZED.
- D. (1) Direct the OATC to insert a Manual Reactor Scram immediately.
(2) UNANALYZED.

B IS CORRECT: When operating with a pressure regulator out of service (EPR/MPR) and Reactor power is between 25% and 90%, then declare APLHGR, MCPR and LHGR limits not met and enter applicable ACTIONS of Technical Specifications 3.2.1, 3.2.2, and 3.2.3. The Thermal limits must be restored within 2 hours, or power must be reduced to < 25% within an additional 4 hours.

Bases: Per GE SIL 614, when operating with a pressure regulator out of service, the plant is vulnerable to a downscale failure of the operating pressure regulator which will cause Reactor pressure and power to increase until a SCRAM occurs on high neutron flux. This particular transient is not bounded by the standard cycle transient analysis. If this condition occurs (either pressure regulator fails) or is out of service, during certain ranges of power operation, the fuel thermal limits from the standard cycle transient analysis are no longer bounding and power must be reduced to a value where thermal margin monitoring is not required. The candidate must calculate % power from MWt. This is 87.4%

A is incorrect: With a pressure regulator failure and power between 25-90% the plant is Unanalyzed for a MPR failure.

C is incorrect: Pushing the EPR STOP pushbutton would be a correct action to take but the plant is Unanalyzed.

D is incorrect: Inserting a scram is a required action if RPV pressure lowered, but this is not required for this condition.

REFERENCE: B.05.09-05 License Requirements Rev 9, TS 3.2.1, 3.2.2, 3.2.3, and 3.7.7 **10 CFR** 55.43 (2)(5)

REFERENCE PROVIDED DURING EXAM: TS 3.2.1, 3.2.2 and 3.2.3

SRO ONLY JUSTIFICATION Technical Specification ACTION & COMPLETION TIME determination.

QUESTION SOURCE: New

TIER: 2 **GROUP:** 2 **CATEGORY:** 239001 Main and Reheat Steam

K/A: A2.01 **IMPORTANCE:** SRO 3.9 **COG LEVEL:** 3SPK

K/A DESCRIPTION: Ability to (a) predicts the impacts of the following on the MAIN AND REHEAT STEAM SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Malfunction of reactor turbine pressure regulating system

DIFFICULTY 3 **LESSON PL:** M8114L-002 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

93. The plant was operating at normal rated power when a LOCA and a breach of primary containment occurred. The following conditions are now present:

- Both SBGT trains failed to initiate
- Reactor pressure 650 psig and slowly lowering
- Reactor water level -94 inches and lowering 1 inch/min
- Drywell pressure 17 psig and rising 0.2 psig/min
- Torus level is +5 inches and rising 1 inch/10min
- Reactor Building D/P is 0 inches H₂O
- NO radiation monitors are in alarm

Based on the given conditions, which of the following actions is required to be directed NEXT?

- A. Drain torus water to radwaste.
- B. Prevent LPCI and Core Spray injection.
- C. Restart Secondary Containment HVAC.
- D. Initiate a normal plant cooldown using main turbine bypass valves.

C IS CORRECT: High drywell pressure and low low Rx level exist with a failure of SBGT to auto initiate. C.5-1300 has an override that directs the restart of reactor building H&V if this condition exists. Candidate must interpret provided conditions and determine RBV plenum is less than 26mr - C.5-3601.

A is incorrect: Torus level rise is slow enough such that the importance of restarting secondary containment ventilation is a much higher priority to prevent a ground level unmonitored release.

B is incorrect: Reactor level is -94 inches and lowering. Preventing LPCI and Core Spray would be an incorrect decision as they may be needed for core cooling.

D is incorrect: MSIVs automatically closed at -47 inches. Additionally, with a level control problem opening the bypass valves to lower pressure would dump reactor inventory and compound the level reduction concern.

REFERENCE: C.5-1300

10 CFR

55.43 (5)

REFERENCE PROVIDED DURING EXAM: EOP Flow charts

SRO ONLY JUSTIFICATION EOP Flowchart navigation and action determination.

QUESTION SOURCE: New

TIER: 2 **GROUP:** 2 **CATEGORY:** 290001 Secondary Containment

K/A: 2.4.6 **IMPORTANCE:** SRO 4.7 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Knowledge of EOP mitigation strategies.

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

94. The plant is operating at rated conditions at 0100 on Wednesday March 26th. Planned continuous maintenance is scheduled to begin at 0800 on #11 EDG. Additionally, system dispatch has just requested removal of the 115 KV Busses from service at 0800 for routine maintenance.

Based on the above conditions, which of the following Work Management practices is correct?

- A. The planned work on #11 EDG can be scheduled for up to 5.25 days without Operations Manager approval.
- B. The off going night crew should enter the EDG action statement and isolate the 11 EDG by 0400.
- C. Both activities should be performed together to avoid multiple electrical maintenance windows.
- D. Removal of the 115KV Busses should be avoided until work is complete on the #11 EDG and it is operable.

D IS CORRECT:

IAW Operations Work Control - The Shift Manager or Control Room Supervisor will maintain responsibility for workweek schedule review and coordination.

IAW General Plant Operating Activities - The plant should be maintained in a stable condition. Other testing or maintenance that increases the likelihood of challenging the operating train or redundant equipment should be avoided. For example, while in a Tech Spec Action on an emergency diesel generator, work/testing in the substation, on electrical buses, High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC), or on the redundant low pressure systems should be avoided.

A is incorrect. For Technical Specification required equipment, the planned work should not be scheduled for more than 50% of the allowed Action Completion time without Operations Manager approval. Removing an EDG will place the plant in a 7 day Action IAW TS 3.8.1 Condition B.

B is incorrect. Example: An EDG should not be isolated on the night shift at 0400 hours with scheduled maintenance set to begin at 0800 hours.

C is incorrect: These activities should not be performed together.

REFERENCE: OWI-02.07, 4AWI-04.01.01 **10 CFR** 55.43 (1)

REFERENCE PROVIDED DURING EXAM: TS 3.8.1

SRO ONLY JUSTIFICATION Knowledge of Work Management practices

QUESTION SOURCE: ILT Bank

TIER: 3 **GROUP:** 2.1 **CATEGORY:** Conduct of Operations

K/A: 2.1.1 **IMPORTANCE:** SRO 4.2 **COG LEVEL:** 1P

K/A DESCRIPTION: Knowledge of conduct of operations requirements.

DIFFICULTY 3 **LESSON PL:** M8108L-038/039 **OBJECTIVE:** 2r, 1e

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

95. The plant is operating at rated conditions. Test 1022 (CRD -WITHDRAWAL STALL FLOW TEST) is about to be performed for a planned routine surveillance.

Which of the following is the minimum required oversight in the Control Room for this reactivity adjustment?

- A. A SRO licensed Lead RO
- B. Duty Control Room Supervisor ONLY
- C. Duty Control Room Supervisor and Shift Manager
- D. Duty Control Room Supervisor and a Reactivity Management SRO (RMSRO)

B IS CORRECT: IAW OWI-01.06 for routine planned reactivity manipulations of short duration such as Control rod exercise and stall flow testing, the duty CRS is sufficient oversight.

A is incorrect: A SRO licensed Lead RO would not be sufficient to oversee this evolution.

C is incorrect: SM only required for Load drops and restorations of 25% RTP, control rod testing in STARTUP or RUN.

D is incorrect: RMSRO required for 25% load drops, major BOP manipulations, Reactor startup/shutdown

REFERENCE: OWI-01.06

10 CFR

55.43 (6)

REFERENCE PROVIDED DURING EXAM: None

SRO ONLY JUSTIFICATION Knowledge of Control Room Supervisor responsibilities

QUESTION SOURCE: ILT Bank – Edits to choices

TIER: 3 **GROUP:** 2.1 **CATEGORY:** Conduct of Operations

K/A: 2.1.2 **IMPORTANCE:** SRO 4.4 **COG LEVEL:** 1P

K/A DESCRIPTION: Knowledge of operator responsibilities during all modes of plant operation.

DIFFICULTY 2 **LESSON PL:** M8108L-038 **OBJECTIVE:** 2

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

96. The plant is operating in Mode 1 following a refuel outage. While performing a review of calibration data on the Main Steam Line Area Temperature Switches, the following AS LEFT trip settings were discovered:

TS-2-121A - 215° F	TS-2-122A - 198° F
TS 2-121B - 201° F	TS 2-122B - 197° F
TS 2-121C - 213° F	TS 2-122C - 210° F
TS 2-121D - 199° F	TS 2-122D - 219° F
TS-2-123A - 204° F	TS-2-124A - 194° F
TS 2-123B - 216° F	TS 2-124B - 196° F
TS 2-123C - 216° F	TS 2-124C - 215° F
TS 2-123D - 208° F	TS 2-124D - 200° F

Given P&ID M-115 and PCIS prints NX-7823-4-4/5, which of the following actions, if any, is required by Technical Specifications AND allows for the maximum completion time?

- A. No action required, two temperature switches per main steam line are operable.
- B. Place the inoperable channel(s) in trip within 12 hours or isolate the affected main steam line.
- C. Place the inoperable channel(s) in trip within 24 hours or be in cold shutdown in the following 36 hours.
- D. Restore primary containment isolation capability within one hour or be in cold shutdown in the following 36 hours.

C IS CORRECT: Even though physically separated from each other, any temperature switch in any of the four areas is able to detect a leak. Therefore, sixteen channels of Main Steam Line Tunnel Temperature - High Function are available but only eight channels [two channels in each of the four (A1, A2, B1, B2) trip strings] are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. For the above conditions, each of the switches in the A2 trip string is high out of spec (>209°F) and inoperable. This requires entry into TS 3.3.6.1 Condition A.

A is incorrect: Plausible if the candidate is confused between the required 2 per trip string vs. 2 per MSL.

B is incorrect: The inoperability of this function is a 24 hour requirement, not 12 hour.

D is incorrect: Primary containment isolation capability is not lost as trip string A1 is still available.

REFERENCE: TS 3.3.6.1 & Bases

10 CFR 55.43 (2)

REFERENCE PROVIDED DURING EXAM: TS 3.3.6.1, P&ID M-115 and PCIS prints NX-7823-4-4/5

SRO ONLY JUSTIFICATION Technical Specification ACTION & COMPLETION TIME determination.

QUESTION SOURCE: Significantly Modified - ILT Bank

TIER: 3 **GROUP:** 2.1 **CATEGORY:** Equipment Control

K/A: 2.2.41 **IMPORTANCE:** SRO 3.9 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to obtain and interpret station electrical and mechanical drawings.

DIFFICULTY 4 **LESSON PL:** M8107L-007 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

97. A plant startup is in progress with the reactor critical and a positive period established in the intermediate range. The Duty RO has completed OPERATIONS DAILY LOG – PART J and has given it to you for review.

Given completed portions of OPERATIONS DAILY LOG – PART J:

Perform a review; checking the leakage calculations and determine which of the following, if any, describes the Technical Specification required action and completion time?

- A. None, RCS Operational LEAKAGE is within limits.
- B. Reduce RCS Total LEAKAGE to within limits in 4 hours.
- C. Reduce RCS Unidentified LEAKAGE to within limits in 4 hours.
- D. Verify RCS Unidentified LEAKAGE increase is not in service sensitive type 304 or type 316 austenitic stainless steel in 4 hours.

C IS CORRECT: The provided daily log is incorrectly calculated. With the given log information the unidentified leakage is >5 gpm which requires restoration within 4 hours.

Distracter A is incorrect. Plausible answer if candidate doesn't recalculate and identify greater than 5 gpm unidentified leakage.

Distracter B is incorrect. Total leakage is high but within limits.

Distracter D is incorrect. The leakage increase is >2 gpm. The LCO and associated action is required to be entered if the plant is in Mode 1. Current plant conditions define Mode 2.

REFERENCE: B.07.01-05 and TS 3.4.4

10 CFR 55.43 (2)

REFERENCE PROVIDED DURING EXAM: TS 3.4.4, Completed Pages 11, 12 and 13 of 0000-J

SRO ONLY JUSTIFICATION Technical Specification ACTION & COMPLETION TIME determination.

QUESTION SOURCE: ILT Bank – 2007 MNGP NRC SRO Retake Exam

TIER: 3 **GROUP:** 2.2 **CATEGORY:** Equipment Control

K/A: 2.2.42 **IMPORTANCE:** SRO 4.6 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Ability to recognize system parameters that are entry-level conditions for Technical Specifications.

DIFFICULTY 3 **LESSON PL:** M8107L-101 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

98. The plant is operating in Mode 1. During performance of routine maintenance it has been determined that both Division II 250 VDC Battery Room Exhaust Fans (V-EF-40A/B) are inoperable.

Which of the following Tech Spec/TRM Required Actions, if any, must be taken and allows for the maximum completion time?

- A. NO action is required; these fans are NOT required for CREF operability.
- B. Declare both CREF subsystems inoperable immediately AND enter LCO 3.0.3.
- C. Place a CREF subsystem in the pressurization mode within 1 hour OR declare both CREF subsystems inoperable within 1 hour and enter LCO 3.0.3.
- D. Place one CREF subsystem in the pressurization mode within 1 hour OR declare one CREF subsystem inoperable within 1 hour and restore to operable status within 7 days.

C IS CORRECT: One channel per trip system is required for CREF operability (TRM 3.3.7.1). With these fans inoperable, the radiation monitors must be declared inoperable. With both radiation monitors inoperable, then CREF (one subsystem) must be placed in the pressurization mode within one hour OR both subsystems must be declared inoperable within one hour. If both subsystems are declared inoperable the entry into LCO 3.0.3 is required immediately.

A is incorrect: These fans are required for CREF operability. This distracter is plausible as the candidate may not recall that air flow over the radiation monitors is required for operability OR they may recall this knowledge but think it's the Division I fans that provide this air flow.

B is incorrect: Although LCO 3.0.3 would be entered if both were declared inoperable for this reason, both CREF subsystems are NOT required to be declared inoperable immediately. This would not allow for maximum completion time.

D is incorrect: TRM requirements are to place both subsystems in the pressurization mode or declare both inoperable within 1 hour. The SRO candidate must have system and TS bases knowledge of how each radiation monitor supplies a trip signal to each CREF subsystem.

REFERENCE: B.08.13-05, TRM 3.3.7.1 and TS 3.7.4 **10 CFR** 55.43 (2)

REFERENCE PROVIDED DURING EXAM: TRM 3.3.7.1 and TS 3.7.4

SRO ONLY JUSTIFICATION Technical Specification ACTION & COMPLETION TIME determination.

QUESTION SOURCE: New

TIER: 3 **GROUP:** 2.3 **CATEGORY:** Radiation Control

K/A: 2.3.15 **IMPORTANCE:** SRO 3.1 **COG LEVEL:** 3SPK/SPR

K/A DESCRIPTION Knowledge of radiation monitoring systems such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

DIFFICULTY 3 **LESSON PL:** M8107L-049 **OBJECTIVE:** 10

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

99. The plant had been operating normally when a plant transient occurred.

At 0100 the WRGMs read as follows:

Stack Effluent Monitor Channel A reads $8.0E+6$ $\mu\text{Ci}/\text{Sec}$.

Stack Effluent Monitor Channel B reads $8.4E+6$ $\mu\text{Ci}/\text{Sec}$.

Reactor Building Vent Effluent Monitor Channel A reads $1.2E+6$ $\mu\text{Ci}/\text{Sec}$

Reactor Building Vent Effluent Monitor Channel B reads $1.0E+6$ $\mu\text{Ci}/\text{Sec}$

At 0105 the WRGMs read as follows:

Stack Effluent Monitor Channel A reads $8.3E+6$ $\mu\text{Ci}/\text{Sec}$.

Stack Effluent Monitor Channel B reads $8.7E+6$ $\mu\text{Ci}/\text{Sec}$.

Reactor Building Vent Effluent Monitor Channel A reads $1.9E+6$ $\mu\text{Ci}/\text{Sec}$

Reactor Building Vent Effluent Monitor Channel B reads $1.6E+6$ $\mu\text{Ci}/\text{Sec}$

As the CRS, complete the following statement for the given conditions (Assume radiation levels continue to rise at the same rate)?

Of the times listed below, entry conditions for C.5-1400 (RADIOACTIVITY RELEASE CONTROL)...

- A. were met at 0100.
- B. were met at 0105.
- C. are not currently met but will be at 0110.
- D. are not currently met and won't be met earlier than 0120.

C IS CORRECT: Entry into EOP-1400 requires the above radiation levels to be at or above the ALERT level. The CRS must use this knowledge and determine EAL RA1.2 for WRGM values for declaring an ALERT are met at 0105 on the RB Vent. This EOP entry condition is determined by the radiation levels in the EAL Matrix which is a SRO ONLY task.

A and B are incorrect: ALERT levels have not been reached.

D is incorrect: Alert Levels are reached at 0110.

REFERENCE: C.5-1400 and EAL Matrix **10 CFR** 55.43 (5)

REFERENCE PROVIDED DURING EXAM: EAL Matrix

SRO ONLY JUSTIFICATION E-Plan EAL Entry and ACTION level determination

QUESTION SOURCE: LOR Bank – Stem and choice edits

TIER: 3 **GROUP:** 2.4 **CATEGORY:** Emergency Procedures / Plan

K/A: 2.4.2 **IMPORTANCE:** SRO 4.6 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Knowledge of system set-points, interlocks and automatic actions associated with EOP entry conditions

DIFFICULTY 2 **LESSON PL:** M8114L-005 **OBJECTIVE:** 3

MNGP 2009 ILT NRC WRITTEN EXAM - KEY

100. The plant was operating at rated conditions when an event occurred resulting in a LOCA. HPCI, RCIC and Reactor Feed Pumps have been unable to maintain RPV water level and the following conditions are now present:

- 15 Bus LOCKOUT has occurred
- RPV pressure is 550 psig and lowering slowly
- RPV water level is – 120 inches and lowering slowly
- 12 and 14 RHR pumps are running in the Torus Spray/Cooling Mode
- 12 Core Spray pump is running with MO-1752 (#12 CS OUTBOARD ISOLATION) OPEN and MO-1754 (#12 CS INBOARD ISOLATION) CLOSED
- Both condensate pumps are running with the Main and Low Flow Feedwater Regulating valves CLOSED and their respective controllers in MANUAL.

As the CRS, which one of the following directions must be given at this time?

- A. Initiate an Emergency Depressurization.
- B. Start an additional low pressure ECCS pump.
- C. Place the Low Flow Feedwater Regulating valve in AUTO.
- D. Place the 12 Core Spray system in its normal injection lineup.

C IS CORRECT: With the current lineup there is only one injection source lined up with a pump running IAW C.5.1-1100 EOP Bases (12 Core Spray). Prior to TAF (-126") EOP-1100 directs that a second injection source be lined up. For the above situation this could be done by placing 12 and 14 RHR pumps in the LPCI Mode or placing a feedwater regulating valve in AUTO.

Distracter A is incorrect. Emergency Depressurization should be directed after going below TAF but before -149".

Distracter B is incorrect. With the given conditions, Division 1 ECCS pumps would be unavailable due to the 15 bus lockout and all Division 2 low pressure ECCS pumps are already running.

Distracter D is incorrect. This is the normal line up for Core Spray.

REFERENCE: C.5.1-1100 Bases and EOP-1100 Flowchart **10 CFR** 55.43 (5)

REFERENCE PROVIDED DURING EXAM: EOP Flow Charts

SRO ONLY JUSTIFICATION EOP Flowchart navigation and knowledge of bases.

QUESTION SOURCE: ILT Bank

TIER: 3 **GROUP:** 2.4 **CATEGORY:** Emergency Procedures / Plan

K/A: 2.4.18 **IMPORTANCE:** SRO 4.0 **COG LEVEL:** 3SPR

K/A DESCRIPTION: Knowledge of the specific bases for EOPs

DIFFICULTY 3 **LESSON PL:** M8114L-005 **OBJECTIVE:** 2

MONTICELLO 2009 Written Exam Answer Key

RO			SRO	
	1. D	41. C		76. A
	2. B	42. D		77. A
	3. D	43. C		78. C
	4. A	44. B		79. A
	5. B	45. C		80. C
	6. D	46. C		81. B
	7. A	47. B		82. C
	8. A	48. A		83. C
	9. A	49. A		84. C
	10. A	50. B		85. A
	11. B	51. B		86. B
	12. D	52. A		87. A
	13. C	53. D		88. C
	14. C	54. A		89. C
	15. C	55. A		90. A
	16. D	56. B		91. A
	17. A	57. B		92. B
	18. B	58. A		93. C
	19. D	59. B		94. D
	20. D	60. C		95. B
	21. C	61. A		96. C
	22. C	62. B		97. C
	23. C	63. C		98. C
	24. D	64. C		99. C
	25. C	65. A		100. C
	26. A	66. B		
	27. B	67. D		
	28. B	68. B		
	29. D	69. C		
	30. A	70. C		
	31. D	71. B		
	32. D	72. D		
	33. D	73. D		
	34. B	74. A		
	35. B	75. C		
	36. A			
	37. D			
	38. D			
	39. A			
	40. C			