

HLC-08 NRC Written Exam

1. 000008 AK1.01 001/PZR VAPOR SPACE ACCI/1/1/3.2/3.7/RO/HIGH/N/A/NEW - 2008/THERMO CHAP 3-008
Given the following:

- The plant is operating at 100% RTP.
- The PRT is at 74% and 110 °F.
- A load rejection results in a Reactor Trip.
- Following the trip, a Pressurizer Safety valve opens, and will NOT reset.
- The PRT rupture disks function as designed.
- Containment pressure peaks at 18 PSIG.

Which ONE (1) of the following is the MAXIMUM temperature indicated by the Safety Valve tailpiece RTD during the entire event?

- A. 222 °F.
- B. 254 °F.
- C. 328 °F.
- D. 338 °F.

The correct answer is D.

Using Steam Tables to determine the correct saturation temperature for the conditions listed. The maximum pressure in the PRT will be 100 PSIG, which corresponds to a saturation temperature of 338 °F. The PRT rupture disks will relieve pressure to Containment (rupture) at 100 PSIG.

- A: Incorrect - Saturation temperature for Containment pressure of 18 PSIG as listed in the question stem, without converting to PSIA.
- B: Incorrect - Saturation temperature for Containment pressure of 32.7 PSIA ($18 + 14.7 = 32.7$ PSIA).
- C: Incorrect - Saturation temperature for 100 PSIA.
- D: Correct - Saturation temperature for $100 + 14.7 = 114.7$ PSIA.

Exam Question Number: 1

Reference: Steam Tables; SD-059 PZR/PRT, Page 12.

KA Statement: Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: Thermodynamics and flow characteristics of open or leaking valves.

History: New - Written for HLC-08 NRC Exam.

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2. 000011 EA1.12 001/LBLOCA/1/1/4.1/4.4/RO/LOW/N/A/NEW - 2008/EPP-9-005

Given the following:

- The plant was operating at 100% RTP when a Large Break LOCA occurred.
- All systems functioned as designed.
- The crew has transitioned to EPP-10, TRANSFER TO LONG TERM RECIRCULATION.

How was the Charging Header SEALED and why?

- A. IVSW initiation automatically sealed the Charging Header.
To prevent leakage by seating the RCP Seal Injection line check valves.
- B. A manual valve alignment of IVSW was performed to seal the Charging Header.
To prevent leakage by seating the RCP Seal Injection line check valves.
- C. IVSW initiation automatically sealed the Charging Header.
To prevent leakage from Containment.
- D. A manual valve alignment of IVSW was performed to seal the Charging Header.
To prevent leakage from Containment.

The correct answer is D.

Upon initiation of a Safety Injection, the IVSW system is automatically actuated. This system has 4 separate headers, three which actuate automatically upon SI and one that must be manually aligned if required. The isolation of the Charging Header is performed manually, during EPP-9, to prevent potential leakage if the Containment is pressurized above Charging Pump header pressure and the Charging Pumps are stopped.

- A: Incorrect - IVSW is applied to the Charging Header between the pump discharge and the discharge check valves, but it is applied manually. This would also open the valves, NOT seat them.
- B: Incorrect - IVSW is manually aligned to the Charging header during EPP-9, however it is applied to the Charging Header between the pump discharge and the discharge check valves. This would open the check valves, NOT seat them.
- C: Incorrect - IVSW is applied to the Charging Header between the pump discharge and the discharge check valves, but it is applied manually. IVSW is applied to the Charging Pump lines to prevent leakage from Containment.
- D: Correct - During EPP-9, IVSW is manually aligned to the Charging header. IVSW is applied to the Charging Pump lines to prevent leakage if Containment is pressurized above Charging Pump header pressure and the Charging Pumps are stopped.

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Exam Question Number: 2

Reference: EPP-9, Pages 32, 33; EPP-9 BD Page 37; SD-021 CVCS, Figure 10.

KA Statement: Ability to operate and monitor the following as they apply to a Large Break
LOCA: Long-term containment of radioactivity.

History: New - Written for HLC-08 NRC Exam.

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3. 000015 AK2.10 001/RCP MALFUNCTIONS/1/1/2.8/2.8/RO/HIGH/N/A/ROBINSON - 2002/AOP-018-004
The plant is operating at 8% RTP and ready to synchronize to the grid when the following conditions are noted:

- APP-001-B2, RCP LABYRTH SEAL LO DP is illuminated.
- APP-001-D2, RCP #1 SEAL LEAKOFF HI FLOW is illuminated.
- Seal Leakoff Flow for RCP "A" is pegged HIGH.
- Seal Leakoff Flow for RCPs "B" and "C" have decreased slightly.
- FCV-626, THERM BARRIER OUTLET, indicates CLOSED.

Which ONE (1) of the following describes the failure that has occurred and what actions are required?

- A✓ #1 seal has failed;
Trip the reactor, trip RCP "A"; enter PATH-1.
- B. The Thermal Barrier has failed;
Trip the reactor, trip RCP "A"; enter PATH-1.
- C. #1 seal has failed;
Place plant in MODE 3 IAW GP-006, NORMAL PLANT SHUTDOWN FROM POWER OPERATION TO HOT SHUTDOWN, and trip RCP "A".
- D. The Thermal Barrier has failed;
Place plant in MODE 3 IAW GP-006, NORMAL PLANT SHUTDOWN FROM POWER OPERATION TO HOT SHUTDOWN, and trip RCP "A".

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The correct answer is A.

During a RCP #1 Seal failure, APP-001-D2 will be received indicating a higher than normal seal leakoff. When this occurs, seal injection will also flow up the seal stack and could cause APP-001-B2 alarm. During a Thermal Barrier failure, flow reverses and flows from the RCS to the ruptured thermal barrier. This will result in APP-001-B2 alarming, however, this robs flow from the #1 Seal leakoff, therefore APP-001-D2 will NOT alarm. Actions of AOP-018 specify that if the plant is in MODE 1, the Reactor shall be tripped, the affected RCP is tripped and PATH-1 entered.

- A: Correct - APP-001-B2 could have been caused by either a Thermal Barrier failure or a #1 Seal failure. The only possible cause for an APP-001-D2 alarm is a #1 seal failure. Since the plant is in MODE 1, the affected RCP must be tripped and PATH-1 entered.
- B: Incorrect - A failure of the Thermal Barrier will NOT cause APP-001-D2 to alarm, #1 Seal Leakoff flow would have gone down and APP-001-D2 would have NOT been received.
- C: Incorrect - Although the failure is correct, with plant in MODE 1, the required action is to trip the Reactor instead of entering GP-006. If the plant were in any other MODE this action would be correct following further investigation of plant parameters.
- D: Incorrect - A failure of the Thermal Barrier will NOT cause APP-001-D2 to alarm, #1 Seal Leakoff flow would have gone down and APP-001-D2 would NOT have been received. If the plant were in any other MODE this action would be correct following further investigation of plant parameters.

Exam Question Number: 3

Reference: APP-001-B2 and D2; AOP-018, Pages 5, 10; SD-001, RCS, Figures 22, 23 and 25.

KA Statement: Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: RCP indicators and controls.

History: Direct from Bank.

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4. 000022 AA1.01 001/LOSS OF RX COOL MAKE/1/1/3.4/3.3/RO/HIGH/N/A/FARLEY - 2001/CVCS-004
Given the following:

- The plant is operating at 100% RTP.
- RCS boron concentration is 600 ppm.
- Earlier in the shift, VCT level transmitter, LT-115, failed LOW.
- All actions of AOP-003, MALFUNCTION OF REACTOR MAKEUP CONTROL, have been completed.
- VCT level transmitter, LT-112, is currently 30 inches and stable.

Subsequently:

- I&C reports they have inadvertently deenergized LT-112.

Which ONE (1) of the following describes how the ACTUAL VCT level and T_{AVG} will respond?
(Assume no operator action)

- A. VCT level increases; T_{AVG} increases.
- B. VCT level decreases; T_{AVG} increases.
- C. VCT level increases; T_{AVG} decreases.
- D. VCT level decreases; T_{AVG} decreases.

The correct answer is C.

- A: Incorrect - RWST will be supplying the charging pump suction with water of 2000+ ppm boron, this will cause T_{AVG} to decrease.
- B: Incorrect - T_{AVG} will NOT increase due to boration of the RCS from the RWST.
- C: Correct - Letdown will still be going to the VCT causing level to increase; boration from the RWST will be causing T_{AVG} to decrease. Having both level transmitters low will open LCV-115B and shut LCV-115C. This swaps charging pump suction from the VCT to the RWST.
- D: Incorrect - VCT level will NOT decrease, there is no outlet flow from the VCT due to LCV-115C going shut and letdown still going to the VCT.

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Exam Question Number: 4

Reference: SD-021, CVCS, Pages 41, 56, Figures 1, 17a, 6; OWP-005, CVCS, Page 53.

KA Statement: Ability to operate and / or monitor the following as they apply to the Loss of Reactor Coolant Makeup: CVCS letdown and charging.

History: Modified from Farley 2001 NRC exam, Changed distractors/answer to T_{AVG} vs Rx power.

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5. 000025 AA2.06 001/LOSS OF RHR/1/1/3.2/3.4/RO/HIGH/N/A/NEW - 2008/AOP-020-004
A Large Break LOCA has occurred and Cold Leg Recirculation is being established IAW
EPP-9, TRANSFER TO COLD LEG RECIRCULATION.

- RHR Pump "A" has just been started.
- RHR Pump discharge pressure is fluctuating by 40 PSIG and flow is approximately 3350 GPM and oscillating.
- APP-001-A7, RHR HX LO FLOW, has alarmed and cleared numerous times.
- APP-003-D3, PRT HI/LO LVL, has just illuminated and is verified HIGH.

Which ONE (1) of the following malfunctions would cause the above event?

- A. ECCS Sump screens are clogging.
- B. SI-871, CS PUMP SUCTION RELIEF VALVE is cycling.
- C. RHR-706, RHR RELIEF VALVE is cycling.
- D. SI-887, RHR RECIRCULATION TO RWST VALVE disc has separated from its valve stem.

The correct answer is C.

- A: Incorrect - Sump screen clogging could cause RHR flow to fluctuate. PRT level indicators make this condition NOT the cause.
- B: Incorrect - SI-871 relief valve could cycle and cause system fluctuations, but this relief valve is ONLY used when in Piggyback mode and relieves to Containment through the CV Spray line, NOT to the PRT.
- C: Correct - Normal flow rate (NOT a suction problem), with pressure oscillations and PRT level indications.
- D: Incorrect - SI-887 is a butterfly valve and if the stem were to be disconnected from the disc, the disc could cause fluctuations as it opened and closed from the force of system flow. However, this valve is isolated from RHR during Cold Leg Recirc. (SI-863A and 863B are closed)

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Exam Question Number: 5

Reference: APP-001-A7; APP-003-D3; SD-003, RHR, Figure 3.

KA Statement: Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Existence of proper RHR overpressure protection.

History: New - Written for HLC-08 NRC exam.

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6. 000026 AA1.02 001/LOSS OF CCW/1/1/3.2/3.3/RO/LOW/N/A/NEW - 2008/AOP-014-003

Given the following:

- The Crew is responding to a LBLOCA IAW PATH-1.
- ALL attempts to start CCW Pumps have failed.
- AOP-014, CCW SYSTEM MALFUNCTION, Section "C", CCW PUMP DISCHARGE PRESSURE LOW is being performed.
- An AO was dispatched to perform Attachment 1, EMERGENCY COOLING TO CHARGING PUMPS.
- Charging Pump "B" is running with speed controller in MANUAL set at 75%.
- All RCP Thermal Barrier DP indications are at approximately 3.5 inches.
- Step 9 of AOP-014, Section "C" directs increasing Charging Pump speed to obtain RCP Thermal Barrier DP of > 5 inches.

Which ONE (1) of the following is the basis for INCREASING the RCP Thermal Barrier DP?

- A. The increased charging ensures RCP Seal leakage will be minimized.
- B. To provide adequate seal injection for RCP Seal cooling.
- C. The increased charging ensures the Charging Pump temperatures remain low until Attachment 1 is completed.
- D. Increasing the Thermal Barrier DP is in preparation for restarting the RCP(s) after CCW is restored.

The correct answer is B.

- A: Incorrect - RCP Seal leakage is NOT a concern for LBLOCA, but is a step for increased seal leakage.
- B: Correct - Thermal Barrier Delta P is the only means of ensuring pump seals are receiving adequate cooling.
- C: Incorrect - Step 9 RNO has direction to wait until Attachment 1 is complete before reducing Charging Pump speed to minimum, but NOT for Charging Pump temperature.
- D: Incorrect - Raising Thermal Barrier Delta P to minimum is a step to start RCPs, but no restart of RCP will occur in this situation.

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Exam Question Number: 6

Reference: AOP-014, Section C, Page 40; AOP-014 BD, Page 24.

KA Statement: Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: Loads on the CCWS in the control room.

History: New - Written for HLC-08 NRC exam.

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7. 000029 G2.1.28 001/ATWS/1/1/4.1/4.1/RO/LOW/N/A/NEW - 2008/AMSAC-006

Which ONE (1) of the following conditions must be met to ACTUATE AMSAC AND what is the result of the actuation?

- A. 2/3 S/G Levels < 11% for 25 seconds;
Direct Reactor Trip.
- B. 1/3 S/G Levels < 11% for 25 seconds;
Direct Turbine Trip.
- C. 1/3 S/G Levels < 11% for 25 seconds;
Direct Reactor Trip.
- D✓ 2/3 S/G Levels < 11% for 25 seconds;
Direct Turbine Trip.

The correct answer is D.

When power is increased above 35% (191 PSIG First Stage Turbine Pressure) on both First Stage Pressure channels, the AMSAC actuation circuit is armed. When 2 of 3 S/G levels decrease below 11% Narrow Range level, an AMSAC actuation will occur after a 25 second Time Delay. When power decreases below 35% on one channel, the AMSAC circuit is disarmed following a 360 second Time Delay.

- A: Incorrect - Once armed, AMSAC actuates on 2/3 S/G levels < 11% for > 25 seconds. This actuation results in a Direct Turbine Trip, NOT a Direct Reactor Trip.
- B: Incorrect - Once armed, AMSAC actuates on 2/3 S/G levels < 11% for > 25 seconds. 1/3 S/G level coincidence is associated with causing a Reactor Trip and AFW actuation at 16% S/G level.
- C: Incorrect - Once armed, AMSAC actuates on 2/3 S/G levels < 11% for > 25 seconds. 1/3 S/G level coincidence is associated with causing a Reactor Trip and AFW actuation at 16% S/G level. This actuation results in a Direct Turbine Trip, NOT a Direct Reactor Trip.
- D: Correct - Once armed, AMSAC actuates on 2/3 S/G levels < 11% for > 25 seconds and causes a Direct Turbine Trip.

Exam Question Number: 7

Reference: APP-005-F6; SD-062, AMSAC, Figure 1.

KA Statement: Knowledge of the purpose and function of major system components and controls.

History: New - Written for HLC-08 NRC exam.

FINAL



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8. 000038 G2.1.20 001/SGTR/1/1/4.6/4.6/RO/LOW/N/A/RNP BANK/PATH-2-003

Given the following:

- The crew is responding to a SGTR in S/G "A" with a loss of offsite power.
- Supplement G is in progress.
- ALL S/G pressures are 1025 PSIG.
- The step in Supplement G which requires Steam Flow to be isolated from the ruptured S/G has just been reached.

Which ONE (1) of the following describes the action that is required regarding the ruptured S/G PORV IAW Supplement G?

- A. Raise the RUPTURED S/G PORV controller's setpoint to MAXIMUM.
- B✓ Verify the RUPTURED S/G PORV controller's setpoint at 1035 PSIG.
- C. Isolate Instrument Air to the RUPTURED S/G PORV.
- D. Verify the RUPTURED S/G PORV controllers' setpoint is 15 PSIG less than the INTACT S/G PORV controllers.

The correct answer is B.

- A: Incorrect - Placing the ruptured S/G PORV to MAXIMUM is undesirable as the PORV will NOT OPEN and pressure will be controlled by S/G Safety Valves, which may NOT reseal if they lift.
- B: Correct - The setpoint on the ruptured S/G PORV is verified at 1035 PSIG. This minimizes the potential for radiological release and ensures the PORV is maintained available to prevent challenging the S/G Safety Valves.
- C: Incorrect - Isolating Instrument Air to the ruptured S/G PORV will prevent an inadvertent release but could challenge the S/G safeties if pressure in the S/G is elevated. It is desired to maintain the S/G PORV operable to allow it to function as designed and provide a controlled release path if steam release is required.
- D: Incorrect - Reducing the RUPTURED S/G's PORV setpoint to less than the intact S/Gs would result in more steam flow from the contaminated S/G, rather than from the intact S/Gs.

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Exam Question Number: 8

Reference: Supplement G, Page 37; Supplement G BD, Pages 4 and 7.

KA Statement: Ability to interpret and execute procedure steps.

History: Direct from Bank.

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9. 000040 AA1.02 001/STM LINE RUPTURE/1/1/4.5/4.5/RO/HIGH/N/A/NEW - 2008/ESF-005

Given the following:

- The plant was operating at 100% RTP when S/G "A" Steamline severs inside Containment.

Which ONE (1) of the following describes the Feed Water valves that will CLOSE as a result of the above conditions?

- A✓ FRVs for ALL THREE S/Gs (FCV-478, 488, 498)
FRV BYPs for ALL THREE S/Gs (FCV-479, 489, 499)
FW HDR SECTION Valves for ALL THREE S/Gs (V2-6A/B/C)
- B. FRVs for ALL THREE S/Gs (FCV-478, 488, 498)
FRV BYPs for ALL THREE S/Gs (FCV-479, 489, 499)
FW HDR SECTION Valve for S/G "A" ONLY (V2-6A)
- C. FRV for S/G "A" ONLY (FCV-478)
FRV BYP for S/G "A" ONLY (FCV-479)
FW HDR SECTION Valve for S/G "A" ONLY (V2-6A)
- D. FRV for S/G "A" ONLY (FCV-478)
FRV BYP for S/G "A" ONLY (FCV-479)
FW HDR SECTION Valves for ALL THREE S/Gs (V2-6A/B/C)

The correct answer is A.

- A: Correct - A S/G steamline severing inside Containment would cause CV pressure to increase to above the CV SI setpoint. When Safety Injection actuates, feedwater will be isolated to ALL S/Gs.
- B: Incorrect - Safety Injection isolates ALL FW HDR Section valves.
- C: Incorrect - Correct answer for FRV and FRV Bypass valves if there were a high S/G level. FW HDR Section valves do NOT go CLOSED on a S/G high level. For an SI, feedwater will be isolated to ALL S/Gs.
- D: Incorrect - Correct answer for FRV and FRV Bypass valves if there were a high S/G level. FW HDR Section valves do NOT go CLOSED on a S/G high level. For an SI, feedwater will be isolated to ALL S/Gs.

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Exam Question Number: 9

Reference: SD-006, ESF, Figure 12.SD-027, FW, Page 20.

KA Statement: Ability to operate and / or monitor the following as they apply to the Steam Line Rupture: Feedwater isolation.

History: New - Written for HLC-08 NRC Exam.

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10. 000054 AA1.02 001/LOSS OF MFW/1/1/4.4/4.4/RO/HIGH/N/A/COOK - 2002/AFW-008
Given the following:

- The Reactor is at 4% RTP in preparation for Turbine startup.
- Main Feedwater Pump "A" is under clearance for maintenance.
- Main Feedwater Pump "B" is operating.
- Narrow range Steam Generator levels are at 44%.

Which ONE (1) of the following statements describes the AFW Pump status immediately after Main Feedwater Pump "B" trips?

- A. The MDAFW and SDAFW Pumps must be manually started.
- B. The MDAFW Pumps have auto started but the SDAFW Pump must be manually started if required.
- C. The SDAFW Pump has auto started but the MDAFW Pumps must be manually started if required.
- D. The MDAFW and SDAFW Pumps have auto started.

The correct answer is B.

Since MFP "A" is under clearance and the breaker is OPEN, when MFP "B" trips the circuit detects a loss of feedwater. Both MDAFW pumps will Auto start on a Loss of Feedwater, but the SDAFW Pump will NOT. The SDAFW Pump Auto starts on S/G LO-LO-level, Bus Undervoltage and AMSAC, but NOT on both MFP breakers being OPEN.

- A: Incorrect - Both MDAFW Pumps will AUTO start on loss of Feedwater, therefore they will NOT need to be started manually. The SDAFW Pump will NOT start and must be manually started.
- B: Correct - Both MDAFW Pumps will AUTO start on loss of Feedwater, the SDAFW Pump will NOT start and if required must be manually started.
- C: Incorrect - The SDAFW Pump will only start on Lo-Lo S/G level, AMSAC, and MFP Bus UV. MDAFW Pumps will start on Lo-Lo Level, AMSAC, loss of Main FW, Blackout, & SI.
- D: Incorrect - SDAFW Pump will NOT auto start. AMSAC will NOT ARM until power has been raised to > 35% and the pump will NOT start unless S/G levels are < 11%.

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Exam Question Number: 10

Reference: SD-042; AFW; Pump Start Logics, Figure 11.

KA Statement: Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW): Manual startup of electric and steam-driven AFW pumps.

History: Changed correct answer to B from D.
FINAL

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11. 000056 AA2.67 001/LOSS OF OFFSITE POWR/1/1/2.9/3.1/RO/LOW/N/A/NEW - 2008/EPP-1-004

During a Loss of All AC Power event, EPP-1, LOSS OF ALL AC POWER, directs the isolation of seal cooling for events of 15 minutes or more without RCP seal cooling.

Which ONE (1) of the following is the basis for isolating seal cooling?

- A✓ RCP seals and shafts may be damaged by thermal shock when power is restored to the DS Bus.
- B. RCP thermal barriers are susceptible to rupture from thermal shock when power is restored to the DS Bus.
- C. Steam binding of the Charging Pumps from RCP seal leakoff flashing when a Charging Pump is restarted.
- D. RCP Thermal Barriers are susceptible to rupture from water hammer when power is restored to the DS Bus.

The correct answer is A.

- A: Correct - Injection loss lasting > 15 minutes may allow seals and shaft to heatup to RCS temperature. Engineering and manufacturer will be consulted prior to restoration.
- B: Incorrect - It is the seal themselves (NOT the Thermal Barrier) which are susceptible to failure from thermal shock.
- C: Incorrect - Steam binding is a possibility due to no CCW, but NOT a reason for isolation after a loss of > 15 minutes.
- D: Incorrect - Water hammer may occur if voids or steam formation in seal injection lines occurs, but it is NOT a reason for isolation after a loss of > 15 minutes.

Exam Question Number: 11

Reference: EPP-1 Page 5; EPP-1 BD, Pages 4-6, 64.

KA Statement: Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Seal injection flow (for the RCPs).

History: New - Written for HLC-08 NRC Exam.

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12. 000057 G2.2.22 001/LOSS OF VITAL AC INS/1/1/4.0/4.7/RO/HIGH/N/A/NEW - 2008/GP-010-002
Given the following:

- The plant is in MODE 6 with refueling in progress.
- Instrument Bus 2 trips.

Which ONE (1) of the following Limiting Conditions for Operation (LCO) REQUIRED ACTIONS is applicable?

- A. ✓ Verify one PAM Source Range monitor provides indication in the CR within 15 minutes AND Log indicated SR count rate every 30 minutes.
- B. Verify one PAM Source Range monitor provides indication in the CR within 15 minutes, suspend core alterations AND suspend positive reactivity additions.
- C. IMMEDIATELY initiate action to restore one SR monitor to OPERABLE AND suspend core alterations AND suspend positive reactivity additions.
- D. IMMEDIATELY initiate action to restore one SR monitor to OPERABLE AND log indicated SR count rate every 30 minutes.

The correct answer is A.

When Instrument Bus 2 trips, the plant will suffer a loss of N-32, SRNI. In MODE 6, LCO 3.9.2, Condition A applies.

- A: Correct - LCO 3.9.2, Condition A, ONE REQUIRED SOURCE RANGE NEUTRON FLUX MONITOR INOPERABLE. The actions states to verify ONE PAM SR monitor is providing indication within 15 minutes and log SR count rate every 30 minutes.
- B: Incorrect - LCO 3.9.2, Condition B, Required actions and completion times of Condition A not met.
- C: Incorrect - LCO 3.9.2, Condition C, BOTH SR monitors INOPERABLE. This requires core alterations and positive reactivity additions to be suspended IMMEDIATELY.
- D: Incorrect - Correct statement for 2 SR INOPERABLE, but logging SR count rate assumes that NI-51A/NI-52A PAM instruments can be substituted for SR monitors.

Exam Question Number: 12

Reference: ITS 3.9.2; GP-010, Pages 11 and 56.

KA Statement: Knowledge of limiting conditions for operations and safety limits.

History: New - Written for HLC-08 NRC Exam.

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13. 000058 G2.2.36 001/LOSS OF DC POWER/1/1/3.1/4.2/RO/HIGH/N/A/NEW - 2008/DC-010
Given the following:

- The plant is operating at 100% RTP.
- Two electricians are performing MST-902, "A" and "B" STATION BATTERY TEST, obtaining battery pilot cell temperatures, electrolyte levels and battery ground checks.
- During the battery checks, Battery Charger "B" was inadvertently tripped.

Which ONE (1) of the following describes the effect on Battery Bus "B" and any LCOs that are applicable?

Battery Bus "B" is...

- A. de-energized. An LCO is in effect to restore power to the bus.
- B. de-energized. LCO 3.0.3 is in effect.
- C. at ~120VDC. An LCO is in effect to restore a battery charger to service.
- D. at ~120VDC. NO LCO is in effect due to Battery Bus "B" energized within normal parameters.

The correct answer is C.

- A: Incorrect - Bus B is still OPERABLE at 120 VDC, only the charger is tripped. Battery "B" is supplying the bus.
- B: Incorrect - Bus B is still energized from the battery. LCO 3.8.4 would be applicable, NOT LCO 3.0.3
- C: Correct - Voltage is still at 120VDC, only the charger has tripped. 2 hour LCO in effect. (LCO 3.8.4, Condition A)
- D: Incorrect - Voltage is still at 120VDC, only the charger has tripped. LCO 3.8.4 should be entered. This is the correct answer for MODE 5. MODE 5 does NOT require an LCO entry for loss of a battery charger if the Bus is energized.

Exam Question Number: 13

Reference: SD-038, DC Distribution; ITS 3.8.4; ITS 3.8.4 BD, Page B3.8-41.

KA Statement: Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

History: New - Written for HLC-08 NRC Exam.

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14. 000062 AK3.02 001/LOSS OF SERV WATER/1/1/3.6/3.9/RO/HIGH/N/A/RNP 2007/SW-008

Given the following:

- The Unit was operating at 100% RTP, when a Pressurizer PORV failure caused a Reactor Trip.
- APP-008-F7, SOUTH SW HDR LO PRESS, is received.
- South SW header pressure is 29 PSIG and slowly decreasing.
- North SW header pressure is 42 PSIG and stable.

Valve Nomenclature:

V6-16A, SW NORTH HEADER SUPPLY TO TURBINE BUILDING.
V6-16B, SW SOUTH HEADER SUPPLY TO TURBINE BUILDING.
V6-16C, SW ISOLATION TO TURBINE BUILDING.

Based on the above conditions, which ONE (1) of the following describes the correct pressure and the response of the Service Water system?

After ONE (1) minute with South SW header pressure less than ...

- A. 40 PSIG,
ONLY valves V6-16B, and V6-16C will close.
- B. 40 PSIG,
Valves V6-16A, V6-16B and V6-16C will close.
- C. 31 PSIG,
ONLY valves V6-16B and V6-16C will close.
- D. 31 PSIG,
Valves V6-16A, V6-16B and V6-16C will close.

The correct answer is C.

A: Incorrect - V6-16B and C will close. 40 PSIG setpoint is alarm setpoint for APP-008-F7 and incorrect for SW isolation.

B: Incorrect - V6-16B and C will close, V6-16A will NOT because there is NO isolation signal for the North SW header. 40 PSIG setpoint is alarm setpoint for APP-008-F7 and incorrect for SW isolation.

C: Correct - V6-16B and C will close at < 31 PSIG SW Header pressure coincident with a Turbine trip.

D: Incorrect - V6-16B and C will close at < 31 PSIG SW Header pressure coincident with a Turbine trip. V6-16A will NOT close.

HLC-08 NRC Written Exam

Exam Question Number: 14

Reference: SD-004, SWS, Page 18, Figures 3,4; APP-008-F7.

KA Statement: Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS.

History: Changed Stem/answer to question valve realignment. (vs. SWB Pump status)

Note: Repeat question from last RNP exam, Modified as listed in History.

FINAL

HLC-08 NRC Written Exam

15. 000065 AA2.05 001/LOSS OF INSTR AIR/1/1/3.4/4.1/RO/LOW/N/A/NEW - 2008/AOP-017-004
Given the following:

- The plant is operating at 12% RTP.
- A line break in the Instrument Air header has occurred.
- IA header pressure is 82 PSIG and decreasing slowly.
- The crew has implemented AOP-017, LOSS OF INSTRUMENT AIR.

In accordance with AOP-017, which ONE (1) of the following REQUIRES the crew to manually trip the reactor and enter PATH-1?

- A. Letdown isolates.
- B. FCV-1740, IA DRYER BYPASS Valve has OPENED.
- C. RCP seal injection flows increase to 20 GPM/Pump.
- D. IA header pressure decreases to 58 PSIG.

The correct answer is D.

- A: Incorrect - AOP-017, Section A has operators check if letdown has isolated, but does NOT direct a Rx trip.
- B: Incorrect - FCV-1740 OPENS automatically at 80 PSIG, AOP-017 directs the operator to check it OPEN, but the Reactor is NOT tripped until air header pressure reaches 60 PSIG.
- C: Incorrect - AOP-017, Section A is for MODE 1/2 operation, Step directs operators to check Seal Injection flow between 8-13 GPM, but allows expanded range of 6-20 GPM.
- D: Correct - AOP-017 directs an immediate Rx Trip if IA header pressure decreases to 60 PSIG.

Exam Question Number: 15

Reference: AOP-017, Pages 4, 5, 11-12.

KA Statement: Ability to determine and interpret the following as they apply to the Loss of Instrument Air: When to commence plant shutdown if instrument air pressure is decreasing.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

16. WE04 EK3.1 001/LOCA OUTSIDE CONTAIN/1/1/3.2/3.5/RO/LOW/N/A/NEW - 2008/EPP-20-002
Given the following:

- The Reactor has tripped due to a LOCA.
- The crew has entered PATH-1.

Which ONE (1) of the following would justify entry into EPP-20, LOCA OUTSIDE CONTAINMENT?

- A. Auxiliary Building Sump level rapidly increasing.
- B. Abnormal radiation in the Auxiliary Building.
- C. RWST level at 27%.
- D. Decreasing CV Pressure with a decreasing RCS pressure.

The correct answer is B.

A: Incorrect - Many different systems could cause a sump level increase. Rising sump level is NOT an entry condition for EPP-20.

B: Correct - The ONLY entry condition to enter EPP-20 is abnormal radiation in the Aux Building that is due to a loss of inventory from the RCS. (LOCA)

C: Incorrect - 27% is the entry condition for EPP-9, TRANSFER TO COLD LEG RECIRCULATION.

D: Incorrect - Increasing RCS pressure is the correct parameter used to ensure that the RCS leak outside Containment is isolated.

Exam Question Number: 16

Reference: EPP-20, Page 3.

KA Statement: Knowledge of the reasons for the following responses as they apply to the (LOCA Outside Containment): Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

History: New - Written for HLC-08 NRC Exam.
FINAL

HLC-08 NRC Written Exam

17. WE11 EK1.2 001/LOSS OF EMER RECIRC/1/1/3.6/4.1/RO/LOW/N/A/NEW - 2008/EPP-15-003

Given the following:

- The plant has experienced a Reactor Trip and LOCA.
- RHR is NOT available.
- The crew has implemented EPP-15, LOSS OF EMERGENCY RECIRCULATION, and is ready to perform Step 18, "Initiate RCS Cooldown to Cold Shutdown".

EPP-15, Step 18 directs the crew to cooldown the RCS at __ (a) __, using __ (b) __ S/Gs.

- A. (a) maximum rate
(b) only intact
- B✓ (a) less than 100 °F/hour
(b) any intact preferred, but faulted if necessary
- C. (a) maximum rate
(b) any intact preferred, but faulted if necessary
- D. (a) less than 100 °F/hour
(b) only intact

The correct answer is B.

A: Incorrect - Cooldown at the maximum rate is used to get the RCS at target temperature for a SGTR per FRP-C.1, Step 21 and in PATH-2.

B: Correct - Step 18 directs the crew to "Maintain cooldown rate in RCS cold legs less than 100 °F in the last 60 minutes." and to "Check at least one S/G available for cooldown". Step 18 RNO specifies that if RHR is NOT available, then a faulted S/G may be used.

C: Incorrect - Rate is incorrect, but S/G to use is correct.

D: Incorrect - Rate is correct, but may use a faulted S/G if NO intact S/G is available.

Exam Question Number: 17

Reference: EPP-15; EPP-15-BD; FRP-C.1, Page 10.

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the (Loss of Emergency Coolant Recirculation): Normal, abnormal and emergency operating procedures associated with (Loss of Emergency Coolant Recirculation).

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

18. 000077 AK2.06 001/GEN VOLT & GRID DIST/1/1/3.9/4.0/RO/LOW/N/A/NEW - 2008/EHC-006
Which ONE (1) of the following is the reason for placing the Governor valves on the Limiter while at 100% RTP?

- A. Reduce the effects of turbine overspeed in the event of a load rejection or Generator output breaker trip.
- B. Prevent Generator overload resulting from Turbine Impulse channel failures and malfunctions.
- C. Prevent Generator load fluctuations induced from Impulse stage pressure fluctuations.
- D Minimize Generator load fluctuations to prevent Reactor power from exceeding license limit.

The correct answer is D.

A: Incorrect - Overspeed and / or Load Rejection will NOT be affected by the position of the Limiter.

B: Incorrect - Impulse channel effects are prevented by placing control to "IMP OUT"

C: Incorrect - Load fluctuations can occur regardless of valve position limit.

D: Correct - Placing the Governor Valves on the Limiter after reaching steady state load prevents the Turbine Generator's Internal Speed Control from trying to maintain 60 Hz if Grid frequency drops.

Exam Question Number: 18

Reference: AOP-026 BD, Page 6.

KA Statement: Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following: Reactor power.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

19. 000001 AK2.08 001/CONT. ROD WITHDRAWAL/1/2/3.1/3.0/RO/HIGH/N/A/NEW - 2008/AOP-001-005
Given the following:

- The plant is at 45% power, with power escalation to 100% RTP in progress.
- Control Bank "D" rods are at 185 steps on the step counters.
- Rod Control is in AUTOMATIC.

- The RO observes ONLY Control Bank "D" rods' IRPI indicators are increasing.
- T_{AVG} is 1.5 °F lower than T_{REF} .

The described conditions indicate...

- A. an electrical problem on Instrument Bus 7A.
- B. a Control Bank "D" Signal Conditioning Module fault.
- C. a Normal Rod Withdrawal.
- D✓ an Uncontrolled Rod Withdrawal.

The correct answer is D.

With T_{AVG} 1.5 °F lower than T_{REF} the bistables for outward rod motion are calling rods to move. Several years ago RNP disconnected the control circuitry to allow for actual rod movement, but the bistables still remain functional. No outward rod motion will occur when the Rod Control switch is in Automatic.

- A: Incorrect - Instrument Bus 7A does supply power to ALL IRPIs, but since ONLY CB "D" IRPIs are changing this CANNOT be the cause. If the candidate misunderstood the power supply configuration they could choose this as a correct answer.
- B: Incorrect - Each IRPI has its own SCM, if the candidate misunderstood that there is NO single SCM for a rod bank or group, they could select this as a correct answer.
- C: Incorrect - The temperature deviation is sufficient for tripping the bistables for outward rod motion, but since RNP has NO automatic Rod Withdrawal, Rods should NOT be moving.
- D: Correct - Since RNP normally has NO Automatic Rod Withdrawal, rods should NOT be moving.

HLC-08 NRC Written Exam

Exam Question Number: 19

Reference: SD-009, IRPI, Figure 22.

KA Statement: Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: Individual rod display lights and indications.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

20. 000005 AK3.01 001/INOPERABLE/STUCK ROD/1/2/4.0/4.3/RO/HIGH/N/A/FARLEY - 2001/EPP-4-004
Given the following:

- The plant has experienced a Reactor/Turbine Trip from 100% RTP.
- The crew is performing EPP-4, REACTOR TRIP RESPONSE.
- Rod Bottom Light for Control Rod M6 is NOT lit.
- IRPI shows Control Rod M6 at 225 steps.

Which ONE (1) of the following action(s), if any, must be performed IAW EPP-4 and why?

- A. Borate to 1950 ppm.
To restore adequate shutdown margin.
- B. Borate for worth of most reactive rod.
To maintain adequate shutdown margin.
- C. Initiate boration to Cold Shutdown requirements.
To restore adequate shutdown margin.
- D. No action required.
Adequate shutdown margin exists.

The correct answer is D.

- A: Incorrect - Boration to 1950 PPM boron is required for refueling shutdown boron concentration. This is required in FRP-S.1 when 2 or more control rods are stuck out. Only 1 control rod is stuck out.
- B: Incorrect - Adequate SDM does exist, accident analysis assumes the most reactive rod is stuck out, NO action is required.
- C: Incorrect - Adequate SDM does exist, this is the required action for TWO or more rods stuck out as directed by EPP-4.
- D: Correct - Accident Analysis supports adequate shutdown margin with one rod stuck out.

Exam Question Number: 20

Reference: EPP-4, Pages 10 and 11; EPP-4 BD, Pages 8 and 9.

KA Statement: Knowledge of the reasons for the following responses as they apply to the Inoperable / Stuck Control Rod: Boration and emergency boration in the event of a stuck rod during trip or normal evolutions.

History: Modified answer to meet RNP procedures, changed answer from boration required (Farley requirement) to no boration required.

FINAL

HLC-08 NRC Written Exam

21. 000028 G2.4.4 001/PZR LVL MALFUNCTION/1/2/4.5/4.7/RO/HIGH/N/A/NEW - 2008/PATH-1-002
Given the following:

- The plant is operating at 50% RTP following a 50% load rejection from 100% RTP.
- APP-003-C8, PZR PROT HI LEVEL is illuminated.
- All Pressurizer Level channels, LI-459A, 460, and 461, indicate 92%.
- RTB A & B CLOSED (RED) indication is illuminated.

Which ONE (1) of the following is the NEXT procedure the crew should implement?

- A. AOP-015, SECONDARY LOAD REJECTION.
- B. AOP-025, RTGB INSTRUMENT FAILURE.
- C. PATH-1.
- D. FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION / ATWS.

The correct answer is C.

A: Incorrect - PATH-1 would take priority over AOP-015 due to having high PZR levels.

B: Incorrect - No instrument failure is indicated.

C: Correct - Pressurizer Levels above 91% (2/3 while greater than P-7) should have initiated a reactor trip. According to OMM-022, EMERGENCY OPERATING PROCEDURES USER'S GUIDE, Section 8.2.1, "Entry into the EOP Network will be required when the following conditions occur: If at any time a reactor trip or safety injection occurs or is required, the Operator will enter PATH-1."

D: Incorrect - PATH-1 is required, FRP-S.1 is NOT a direct entry procedure.

Exam Question Number: 21

Reference: APP-003-C8; OMM-022, Page 10, Step 8.2.1.1.

KA Statement: Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

22. 000032 AK1.01 001/LOSS OF SR NI/1/2/2.5/3.1/RO/HIGH/N/A/TURKEY POINT - 2001/COMPON CHAP 2-020
I&C has just completed a surveillance on the high voltage power supply to the Source Range nuclear instruments. The surveillance determined the as-found voltage was 1400 VDC, instead of the normal 1600 VDC.

Which ONE (1) of the following describes the effect and reason the lower voltage has on SR N-31 and N-32 instrument response?

N-31 and N-32 indication will....

- A. decrease because a lower input voltage to the Pre-Amplifier results in overall reduced detector efficiency.
- B. increase due to a reduction of pulse height discriminations that allows more ionization events to pass through the discriminator circuit.
- C. increase due to a reduction in gamma compensation, allowing more, lower energy events to pass through the pulse height discriminator circuit.
- D. decrease because reduced voltage results in fewer ion pairs reaching the detector electrodes due to lower potential applied to the detector.

The correct answer is D.

- A: Incorrect - Detector high voltage is ONLY applied to the detector, NOT the amplifier circuits. Any reduction in detector high voltage will NOT affect the operation of the Pre-amplifier.
- B: Incorrect - Pulse height discriminator circuit has no relation to the High Voltage applied to the detector.
- C: Incorrect - There is NO gamma compensation circuit (IR Detector Only).
- D: Correct - The high voltage is set at 1600 VDC in the Proportional Region of the detector curve, such that a significant reduction in applied voltage will result in a reduced count rate.

Exam Question Number: 22

Reference: SD-010, NI, Pages 16-17, Figure 7.

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Loss of Source Range Nuclear Instrumentation: Effects of voltage changes on performance.

History: Modified by changing three distractors and updating to RNP equipment voltages.

FINAL

HLC-08 NRC Written Exam

23. 000037 AA1.06 001/SG TUBE LEAK/1/2/3.8/3.9/RO/HIGH/N/A/NEW - 2008/AOP-035-002
Given the following:

- The plant is at 30% RTP, with a power escalation in progress.
- APP-036-C7, R-24 MONITOR HI has just alarmed.

Which ONE (1) of the following describes the R-24, MAIN STEAM LINE N-16 DETECTOR alarm and what actions are required for current plant conditions?

- A. The R-24 alarm is valid, crew must enter AOP-005, RADIATION MONITORING SYSTEM.
- B. R-24 information is useful only for trending. If R-15, CONDENSER AIR EJECTOR OR R-19, STEAM GENERATOR BLOWDOWN confirms evidence of leakage, refer to AOP-035, S/G TUBE LEAKAGE.**
- C. The R-24 alarm is valid, crew must enter AOP-035, S/G TUBE LEAKAGE.
- D. R-24 information is useful only for trending. Adjust R-24 leakage model firmware to support leakage confirmation and leak location determination IAW EMP-034, OPERATION OF R-24 A, B and C.

The correct answer is B.

- A: Incorrect - AOP-005 is to be entered when "one or more Plant Process, Area, or Accident Radiation Monitors" are in alarm. R-24 is NOT an entry condition for AOP-005. R-24 is an N-16 monitor.
- B: Correct - Entry into AOP-035 is NOT justified unless R-15 or R-19 indication confirms primary to secondary leakage, due to the limitations of R-24 when power is less than 40%.
- C: Incorrect - Confirmation of S/G Tube Leakage is required for AOP entry. This would be confirmed by an increasing trend.
- D: Incorrect - Action to adjust leakage model firmware is to make R-24 valid below 40% power. This may be performed during extended low power operation. Adjustment of firmware does NOT provide confirmation of S/G leakage, it must be confirmed by diverse indications from other plant parameters.

Exam Question Number: 23

Reference: AOP-035, Page 3; APP-036-C7.

KA Statement: Ability to operate and / or monitor the following as they apply to the Steam Generator Tube Leak: Main steam line rad monitor meters.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

24. 000068 AA2.05 001/CONTROL ROOM EVAC/1/2/4.2/4.3/RO/LOW/N/A/NEW - 2008/AOP-004-005
Which ONE (1) of the following describes the type of indication available and location OUTSIDE of the Control Room to monitor the availability of Heat Sink?

- A. Steam Flow and Feedwater Flow for all 3 S/Gs at the Secondary Control Panel.
- B. All 3 S/G Levels and Pressures at the Charging Pump Room Panel.
- C✓ All 3 S/G Levels and Pressures at the Secondary Control Panel.
- D. Steam Flow and Feedwater Flow for all 3 S/Gs at the Charging Pump Room Panel.

The correct answer is C.

A: Incorrect - There are NO Steam Flow/Feed Flow indications available outside of the Control Room at the Secondary Control Panel.

B: Incorrect - S/G Pressure is NOT available at the Charging Pump Room Panel.

C: Correct - WR S/G Levels and S/G PORVs and PICs are available at the Secondary Control Panel.

D: Incorrect - There are NO Steam Flow/Feed Flow indications available outside of the Control Room at the Charging Pump Room Panel.

Exam Question Number: 24

Reference: AOP-004, Pages 18 and 26.

KA Statement: Ability to determine and interpret the following as they apply to the Control Room Evacuation: Availability of heat sink.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

25. 000069 AK1.01 001/LOSS OF CONT INTEG/1/2/2.6/3.1/RO/HIGH/N/A/NEW - 2008/COMPON CHAP 2-010
Given the following:

- A Large Break LOCA has occurred.
- Leakage has been identified from Containment to the Auxiliary Building.
- Containment pressure peaked at 36 PSIG and has lowered to 18 PSIG.

Current leakage is approximately _____ of the peak leak rate.

- A. 25%
- B. 30%
- C. 50%
- D. 70%

The correct answer is D.

A: Incorrect - Square of the ratio of current CV pressure to initial CV pressure.

B: Incorrect - Algebraic inverse of the correct answer. Candidate calculates a 70% reduction.

C: Incorrect - The direct ratio of pressure reduction, without allowing for the square root.

D: Correct - The pressure reduction is 18 PSIG, 70% is the square root of initial pressure over current pressure.

Exam Question Number: 25

Reference: GFES, Detectors section of Components, Equation 2-2.

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Loss of Containment Integrity: Effect of pressure on leak rate.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

26. WE13 EK2.2 001/SG OVERPRESSURE/1/2/3.0/3.2/RO/HIGH/N/A/NEW - 2008/FRP-H.2-002

Given the following:

- A Reactor trip has occurred. The crew is preparing to transition from PATH-1 after checking SI NOT actuated OR required.
- ALL S/G levels are 10-14% Narrow Range.
- AFW flow indicates 400 GPM.
- S/G "A" and "B" pressures indicate 1080 PSIG.
- S/G "C" pressure indicates 1150 PSIG.

Which ONE (1) of the following describes the status of CSF-3, HEAT SINK and the initial crew actions to address the event?

- A. RED; Check total feedwater flow less than 300 GPM due to operator action, IAW FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.
- B. YELLOW; Isolate feedwater to affected S/G IAW FRP-H.2, RESPONSE TO S/G OVERPRESSURE.
- C. YELLOW; Check any S/G level greater than 75% IAW FRP-H.3, RESPONSE TO S/G HIGH LEVEL.
- D. YELLOW; Check level in affected S/G less than 16% IAW FRP-H.5, RESPONSE TO STEAM GENERATOR LOW LEVEL.

The correct answer is B.

A: Incorrect - No RED status, but correct actions for FRP-H.1.

B: Correct - Any S/G pressure > 1140 PSIG is YELLOW status, entry condition for FRP-H.2, initial action is to ISOLATE flow to affected S/G.

C: Incorrect - FRP-H.3 YELLOW would apply IF affected S/G Level was high.

D: Incorrect - Incorrect entry, S/G levels are required to be less than 8% for FRP-H.5 entry.

Exam Question Number: 26

Reference: FRP-H.2, Pages 3-4; H.1, Page 3; H.3, Page 3; H.5, Page 3; CSFST, Page 5.

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

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

27. WE15 G2.2.38 001/CTMT FLOODING/1/2/3.6/4.5/RO/LOW/N/A/RNP AUDIT - 2001/FRP-J.2-003

Given the following:

- A Large Break LOCA has occurred.
- ALL systems automatically respond as expected.
- CV Sump level indicates 378 inches and is increasing slowly.

Which ONE (1) of the following identifies the MAJOR concern or license limitation associated with this condition IAW FRP-J.2, RESPONSE TO CONTAINMENT FLOODING?

- A. Containment integrity is compromised due to reduced volume and potentially increased CV pressure.
- B. Dilution of sump water with CCW or Fire Water may cause a return to criticality.
- C✓ Water introduced into the ECCS sump beyond capacity can potentially affect the operation of vital equipment.
- D. Loss of inventory from interfacing cooling systems can potentially result in a loss of ability to remove heat from the reactor core.

The correct answer is C.

- A: Incorrect - ITS Bases addresses Containment Integrity as part of OPERABILITY and more water inside the Containment would reduce the total volume, but analysis assumptions already takes this into account and the Bases does NOT address an increased pressure as a concern.
- B: Incorrect - AOP-032, RESPONSE TO FLOODING FROM THE FIRE PROTECTION SYSTEM Bases addresses the dilution of the CV Sump as an "unanalyzed condition that would dilute LOCA water before a sump recirc condition." The Basis for FRP-J.2, CONTAINMENT FLOODING does NOT address reactivity as a concern. Both CCW and Firewater are isolated on Phase A and Phase B Containment isolation which would occur during a LBLOCA.
- C: Correct - The purpose of the sump is to collect and divert water in areas that will NOT affect vital plant equipment. Flooding may jeopardize that function.
- D: Incorrect - A loss of ability to remove heat is dealt with in other procedures. The major concern in FRP-J.2 is Containment flooding.

HLC-08 NRC Written Exam

Exam Question Number: 27

Reference: FRP-J.2 BD, Page 3; AOP-032 BD, Page 4 and 6.

KA Statement: Knowledge of conditions and limitations in the facility license.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

28. 003 K6.04 001/REAC COOL PUMP/2/1/2.8/3.1/RO/LOW/N/A/NEW - 2008/CCW-009

During Containment isolation valve testing, CCW-716A, CCW to RCP ISOLATION VALVE, was inadvertently CLOSED with RCP "B" running.

Which ONE (1) of the following RCP components suffered a loss of cooling water flow?

- A. Motor Bearing Oil Coolers ONLY.
- B. Thermal Barrier Heat Exchangers ONLY.
- C✓ Thermal Barrier Heat Exchangers and Motor Bearing Oil Coolers.
- D. Motor Air Coolers, Thermal Barrier Heat Exchangers, and Motor Bearing Oil Coolers.

The correct answer is C.

A: Incorrect - Motor Oil Cooler is correct, but NOT a complete answer as Thermal Barrier HX is also cooled by CCW.

B: Incorrect - Thermal Barrier HX is correct, but NOT a complete answer as the Motor Oil Cooler is also cooled by CCW.

C: Correct - CCW -716A is the CCW supply to all RCP cooling. Discharge lines have separate isolation valves.

D: Incorrect - Motor Air Coolers are CV HVH units which are cooled with Service Water.

Exam Question Number: 28

Reference: SD-013, CCW, Pages 20-21, Figure 3.

KA Statement: Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Containment isolation valves affecting RCP operation.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

29. 004 A1.05 001/CVCS/2/1/2.9/3.2/RO/HIGH/N/A/NEW - 2008/CVCS-008
Given the following:

- A S/G Tube Rupture has occurred.
- An RCS Cooldown has been performed IAW PATH-2.
- Rapid RCS depressurization is in progress.

Which ONE (1) of the following describes how Charging Flow will be controlled during subsequent actions IAW PATH-2?

- A✓ Reduce Charging Flow to MINIMUM when PZR level exceeds 10%.
- B. Reduce Charging Flow to MINIMUM ONLY when PZR level exceeds 24%.
- C. Maintain MAXIMUM Charging Flow until PZR level exceeds 24% AND SI Pumps are stopped.
- D. Maintain MAXIMUM Charging Flow until RCS pressure is less than ruptured S/G pressure.

The correct answer is A.

During rapid depressurization of the RCS to equalize RCS and ruptured S/G pressure as directed by PATH-2, PZR level will be regained rapidly. Charging flow is reduced to minimum to allow RCS depressurization while attempting to maintain PZR level less than 71%.

- A: Correct - Reducing Charging flow to minimum will allow the RCS to be depressurized and provide additional time prior to exceeding 71% PZR level which will cause the depressurization to be stopped. This is performed when PZR level returns to scale at 10% level.
- B: Incorrect - Reducing Charging flow to minimum will allow the RCS to be depressurized and provide additional time prior to exceeding 71% PZR level which will cause the depressurization to be stopped. This is performed when PZR level returns to scale at 10% level, NOT at 24% level.
- C: Incorrect - Charging flow will be minimized at 10% PZR level, NOT left at maximum flow until 24% PZR level is reached.
- D: Incorrect - Charging flow will be minimized at 10% PZR level, NOT left at maximum flow until RCS pressure is less than ruptured S/G pressure.

HLC-08 NRC Written Exam

Exam Question Number: 29

Reference: PATH-2.

KA Statement: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including: S/G pressure and level.

History: New - Written for HLC-08 NRC exam.
FINAL

HLC-08 NRC Written Exam

30. 005 K1.06 001/RHR/2/1/3.5/3.6/RO/HIGH/N/A/NEW - 2008/RHR-008

Given the following:

- A Small Break LOCA occurred 3 hours ago.
- RCS pressure is 210 PSIG.
- The alignment of the ECCS for Cold Leg Recirculation is complete IAW EPP-9, TRANSFER TO COLD LEG RECIRCULATION.

Which ONE (1) of the following describes the current RHR/ECCS alignment?

ONE (1) RHR Pump and ONE (1) SI Pump operating in series (Piggy-back mode), with the...

- A. RHR AND SI Pump suctions from the CV sump, discharging to RCS cold legs via RHR HX (RHR Pump), and the BIT.
- B. RHR Pump suction from the CV sump, discharging through RHR HX to SI Pump suction, SI Pump discharging to RCS cold legs via the BIT.
- C. RHR Pump suction from the CV sump, discharging through RHR HX to RCS cold legs AND to SI Pump suction, SI Pump discharging to RCS cold legs via the BIT.
- D. RHR Pump suction from the CV sump, discharging through RHR HX to SI Pump suction, SI Pump discharging to RCS hot legs.

The correct answer is B.

A: Incorrect - No CV sump suction to the SI pumps.

B: Correct - This is the proper alignment and injection path due to RCS pressure being greater than the RHR Pump shutoff head (110 PSIG).

C: Incorrect - RCS pressure is above RHR Pump shutoff head.

D: Incorrect - Correct alignment for Hot leg recirculation 11 hours after the accident.

Exam Question Number: 30

Reference: SD-002, SI, Pages 9, 10, 11, Figure 5.

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between the RHRS and the following systems: ECCS.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

31. 006 K2.01 001/EMERG CORE COOLING/2/1/3.6/3.9/RO/HIGH/N/A/NEW - 2008/SI-006
The plant is operating at 100% RTP with a normal electrical lineup.

- Breaker 52/10, 4kV Bus 1-2 Tie Bkr, trips OPEN.
- An inadvertent Safety Injection signal occurs.

Which ONE (1) of the following describes the source of power to the SI Pumps?

- A. SI Pumps "A" and "C" are powered from off-site power.
- B✓ SI Pump "A" is powered from EDG "A", SI Pump "C" is powered from off-site power.
- C. SI Pump "A" is powered from off-site power, SI Pump "C" is powered from EDG "B".
- D. SI Pumps "A" and "C" are powered from EDG "A" and "B", respectively.

The correct answer is B.

A: Incorrect - When breaker 52/10 trips, 4kV Bus 2 de-energizes, this de-energizes 480V Bus 1 and E-1. EDG "A" starts and energizes 480V Bus E-1. ONLY E-1 is energized from the EDG

B: Correct - When breaker 52/10 trips, 4kV Bus 2 de-energizes, this de-energizes 480V Bus 1 and E-1. EDG "A" starts and energizes 480V Bus E-1. Bus E-2 remains energized from off-site power.

C: Incorrect - EDG "B" starts on SI signal but does NOT energize 480V Bus E-2.

D: Incorrect - EDG "B" starts on SI signal but does NOT energize 480V Bus E-2.

Exam Question Number: 31

Reference: OP-603, Page 15; GP-005, Page 54, Section 8.4.42; SD-039 KVAC, Pages 12-14, Figure 2.

KA Statement: Knowledge of bus power supplies to the following: ECCS pumps.

History: New - Written for HLC-08 NRC exam.
FINAL

HLC-08 NRC Written Exam

32. 007 K4.01 001/PRT/QUENCH TANK/2/1/2.6/2.9/RO/HIGH/N/A/NEW - 2008/PZR-008

Given the following:

- The plant is in MODE 3 following a load rejection and Reactor Trip from 100% RTP.
- During the load rejection/trip event, a Pressurizer PORV opened for several seconds and reseated.
- Pressurizer Relief Tank Pressure, Temperature and Level have increased:
 - Pressure = 4.8 PSIG.
 - Temperature = 153 °F (APP-003-B3, PRT HI TEMP is illuminated.)
 - Level = 80%
- The CRSS directs implementation of OP-103, PRESSURIZER RELIEF TANK CONTROL SYSTEM to reduce PRT temperature.

Which ONE (1) of the following methods will be used to reduce PRT temperature?

- A. Continuously fill the PRT with Primary Water and drain the PRT via the RCDT Pump as necessary to maintain level between 70%-80%.
- B. Drain the PRT via the RCDT Pump to 70%, then alternately refill with Primary Water and drain via the RCDT Pump.
- C. Fill the PRT with Primary Water to 90%, then alternately drain the PRT via the RCDT Pump and refill with Primary Water.
- D. Monitor Automatic Primary Water spray, drain PRT via the RCDT Pump as necessary to maintain level between 70%-80%.

The correct answer is B.

- A: Incorrect - A continuous drain and fill is incorrect because the tank will fill faster than the drain capability. NO procedures support this action.
- B: Correct - For high PRT temperature, OP-103 directs draining the PRT to 70%-74%, then to fill with PW to cool the PRT.
- C: Incorrect - For rapid cooling and if level allows, the PRT is filled first then allowed to 'soak' for 10 minutes and then drained. Precautions and Limitations state that the tank should NOT be filled above 80% level.
- D: Incorrect - RNP has NO automatic Primary Water Spray available to the PRT.

HLC-08 NRC Written Exam

Exam Question Number: 32

Reference: OP-103, Pages 6-10; APP-003-B3, SD-059 PZR/PRT, Figure 1.

KA Statement: Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: Quench tank cooling.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

33. 008 A4.05 001/CCW/2/1/2.7/2.5/RO/LOW/N/A/NEW - 2008/CCW-009
Given the following:

- The plant is in EPP-10, TRANSFER TO LONG TERM RECIRCULATION.
- APP-002-E5, SI PMP COOL WTR LO FLOW alarm is received.

Which ONE (1) of the following describes the cause and effect of the alarm?

- A. Loss of CCW to the SI Pump Bearing Heat Exchangers; can result in overheating the pump bearings.
- B. Loss of CCW to the SI Pump Seal Coolers; can result in loss of SI Pump seals.
- C. Loss of SW to the SI Pump Bearing Heat Exchangers; can result in overheating the pump bearings.
- D. Loss of SW to the SI Pump Seal Coolers; can result in loss of SI Pump seals.

The correct answer is B.

A: Incorrect - CCW supplies SI Pump Seal Coolers, NOT Bearing Heat Exchangers.

B: Correct - CCW Low flow (50 GPM) to the Seal Coolers initiates the alarm.

C: Incorrect - SW does NOT supply SI Pump Bearing Heat Exchangers. SW does supply SI Pump Thrust Bearing cooling bath, but has NO alarm.

D: Incorrect - SW does NOT supply SI Pump Seal Coolers. SW does supply SI Pump Thrust Bearing cooling bath, but has NO alarm.

Exam Question Number: 33

Reference: APP-002-E5; SD-013 CCW, Page 13.

KA Statement: Ability to manually operate and/or monitor in the control room: Normal
CCW-header total flow rate and the flow rates to the components cooled by the CCWS.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

34. 010 K5.01 001/PZR PRESSURE CONTROL/2/1/3.5/4.0/RO/HIGH/N/A/NEW - 2008/THERMO CHAP 3-008
Given the following:

- The plant is in MODE 3.
- The crew is performing a plant heatup.
- Pressurizer level is 50%.
- BOTH Pressurizer Liquid Space and Steam Space temperature indicators read 622 °F.

Which ONE (1) of the following indicates actual Pressurizer Pressure?

- A. PI-444 = 1783 PSIG.
- B. PI-445 = 1798 PSIG.
- C. PI-455 = 1813 PSIG.
- D. PI-456 = 1828 PSIG.

The correct answer is B.

A: Incorrect - Subtracted 14.7 PSI from corrected answer.

B: Correct - Using Steam Tables, interpolate for 622 °F. 620 °F = 1786.9 PSIA, 624 °F = 1839.0 PSIA. Therefore 622 °F = 1812.95 PSIA. Convert 1812.95 PSIA to PSIG: 1812.95 PSIA - 14.7 PSI = 1798.25 PSIG

C: Incorrect - Listed answer without adjusting for PSIA.

D: Incorrect - Added 14.7 PSI instead of subtracting to obtain PSIG.

Exam Question Number: 34

Reference: Steam Tables; SD-059 PZR/PRT, Figure 1.

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the PZR PCS: Determination of condition of fluid in PZR, using steam tables.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

35. 012 K6.01 001/RX PROTECTION/2/1/2.8/3.3/RO/HIGH/N/A/COOK - 2002/RPS-006
Given the following:

- The plant is operating at 6% RTP preparing for Turbine roll.
- PZR level channel LT-459 failed 4 hours ago. The bistables have been tripped and all actions are complete per AOP-025, RTGB INSTRUMENT FAILURE.
- PZR level is currently 25% on Channels LT-460 and 461.

Which ONE (1) of the following describes the effects on the plant if PZR level channel LT-461 fails HIGH?

- A. A Reactor Trip due to high PZR level.
- B. A Reactor Trip due to low PZR pressure.
- C✓ The Reactor will NOT trip, signal is blocked by P-7.
- D. The Reactor will NOT trip, signal is blocked by P-10.

The correct answer is C.

A: Incorrect - A High Level trip signal is generated from the channel failure, but it is blocked by P-7.

B: Incorrect - A trip will NOT occur due to low PZR pressure due to being blocked by P-7.

C: Correct - With Channel LT-459 in the tripped condition the High level Rx Trip signal will be made up for 1 channel (1/2 coincidence on remaining channels). The level control selector switch for the Pressurizer is in the 461 REPLACE 459 position with channel LT-461 as the controlling channel. When it fails high a High Level Rx Trip signal is generated but it is blocked by P-7 (Reactor and Turbine power both below 10%).

D: Incorrect - Signal is blocked by Permissive P-7, (Turbine Power) NOT P-10, (NI Power).

Exam Question Number: 35

Reference: SD-011 RPS, Pages 20-21, 29, Figure 31.

KA Statement: Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Bistables and bistable test equipment.

History: Modified; removed LCO actions.

FINAL

HLC-08 NRC Written Exam

36. 013 G2.2.38 001/ESFAS/2/1/3.6/4.5/RO/HIGH/N/A/NEW - 2008/ESF-008

Given the following:

- The plant is operating at 100% RTP when PT-455, PZR PRESSURE fails LOW.
- Prior to OWP-029, PPT-1 implementation, a loss of power to INSTRUMENT BUS 2 occurs.

What effect does this have on the PZR Pressure ESFAS bistables? (Assume NO operator action)

- A. PZR Pressure ESFAS bistables on Train "A" ONLY are tripped.
Enter LCO 3.3.2, Condition D, Place channel in trip within 6 hours.
- B. PZR Pressure ESFAS bistables on Train "B" ONLY are tripped.
Enter LCO 3.3.2, Condition D, Place channel in trip within 6 hours.
- C✓ PZR Pressure ESFAS bistables on Train "A" AND Train "B" are tripped.
Enter LCO 3.0.3, Place plant in MODE 4 within 13 hours.
- D. PZR Pressure ESFAS bistables on Train "A" AND Train "B" are tripped.
ALL Instrumentation LCOs are currently met.

The correct answer is C.

PT-455 feeds BOTH high and low pressure RPS on BOTH Train "A" and Train "B" and low pressure bistables for ESFAS. When PT-455 fails LOW, ONLY the low pressure RPS and ESFAS bistables are actuated. When Instrument Bus 2 fails, ALL three of the PZR pressure bistables (high and low) deenergize to actuate.

- A: Incorrect - The ESFAS bistables provide input to BOTH Trains, so BOTH would be tripped.
- B: Incorrect - The ESFAS bistables provide input to BOTH Trains, so BOTH would be tripped.
- C: Correct - The ESFAS bistables provide input to BOTH Trains, so BOTH are tripped. The loss of Instrument Bus 2 will cause a Reactor Trip and Safety Injection signal to be generated. Due to the failure of 2 PZR pressure transmitters, the bistables CANNOT be tripped in the Hagan Racks, thus the plant must be placed in a mode where the LCO is NOT applicable.
- D: Incorrect - The ESFAS bistables are tripped for PT-455 and PT-456. Instrumentation LCOs are NOT met until the bistables have been placed in the tripped position in the Hagan Racks. Due to the failure of 2 PZR pressure transmitters, the bistables CANNOT be tripped in the Hagan Racks, thus the plant must be placed in a mode where the LCO is NOT applicable.

HLC-08 NRC Written Exam

Exam Question Number: 36

Reference:ITS Section 3.3.2, ITS LCO 3.0.3

KA Statement: Knowledge of conditions and limitations in the facility license.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

37. 022 A3.01 001/CTMT COOLING/2/1/4.1/4.3/RO/HIGH/N/A/NEW - 2008/CVHVAC-008
Given the following:

- The plant is operating at 100% RTP.
- HVH-3 has been experiencing intermittent problems and the fan has been stopped.
- APP-002-E6, HVH-1/2/3/4 EMERGENCY CONTROL is illuminated.
- CV RECIRC FAN HVH-3 indication on the RTGB is extinguished.

- An inadvertent Safety Injection is received.

Which ONE (1) of the following describes the current status of HVH-3?

The Fan ...

- A✓ is stopped and will NOT AUTO start.
- B. is stopped and can be started from the RTGB.
- C. has Auto started due to the SI signal.
- D. has Auto started due to a Low Air Flow signal.

The correct answer is A.

- A: Correct - The Local-Remote switch inhibits automatic starts of the HVH-3 fan when in LOCAL.
- B: Incorrect - In LOCAL, the only place that component can be operated is the Local Control Station.
- C: Incorrect - LOCAL-REMOTE Switch must be placed in REMOTE for ANY Auto signals to actuate equipment.
- D: Incorrect - Low Air flow will alarm (APP-002-C5), but provides NO Auto start feature of the Fan.

Exam Question Number: 37

Reference: APP-002-E6; APP-002-C5.

KA Statement: Ability to monitor automatic operation of the CCS, including: Initiation of safeguards mode of operation.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

38. 026 A1.01 001/CTMT SPRAY/2/1/3.9/4.2/RO/HIGH/N/A/RNP AUDIT BANK/CSS-005
Given the following:

- A Reactor Trip and Safety Injection have occurred due to a Faulted S/G.
- 480V Bus E-1 fault occurred coincident with the Reactor Trip and remains deenergized.
- The crew is performing actions of PATH-1 and direction has just been given to OPEN the breaker for HVS-1 on MCC-5.
- Containment pressure is 17 PSIG and increasing.

Which ONE (1) of the following is the impact on the plant and the action required?

Accident analysis has determined that Containment pressure...

- A. MAY exceed design. Immediately transition to FRP-J.1, RESPONSE TO HIGH CONTAINMENT PRESSURE, due to an ORANGE condition.
- B. will NOT exceed design. Continue in PATH-1 until SPDS is reset and transition as directed.
- C. MAY exceed design. Continue in PATH-1 until SPDS is reset and transition as directed.
- D. will NOT exceed design. Transition to FRP-J.1 if 480V Bus E-1 CANNOT be restored.

The correct answer is B.

- A: Incorrect - Minimum safeguards equipment (1 train of CV Spray and 2 HVH units) is required to maintain design parameters. CV Spray Pump "B" and all other Train "B" ECCS equipment is operating.
- B: Correct - Pressure will NOT exceed design if 1 train of CV Spray and 2 HVH units are operating. The crew should continue in PATH-1 until told to transition to another procedure if applicable.
- C: Incorrect - Minimum safeguards equipment (1 train of CV Spray and 2 HVH units) is required to maintain design parameters. CV Spray Pump "B" and all other Train "B" ECCS equipment is operating.
- D: Incorrect - Transition to FRP-J.1 does NOT depend on the restart of CV Spray Pump "A". It depends on CV pressure exceeding 42 PSIG or NO CV Spray available above 10 PSIG.

HLC-08 NRC Written Exam

Exam Question Number: 38

Reference: PATH-1 BD, Pages 7, 8 for grid location E-3 (E-1 AND E-2 energized); SD-024, Containment Spray, Page 7.

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

History: Modified; removed operator actions to restart CV Spray.

FINAL

HLC-08 NRC Written Exam

39. 039 G2.4.20 001/MAIN/REHEAT STEAM/2/1/3.8/4.3/RO/LOW/N/A/NEW - 2008/PATH-2-003

Given the following:

- A SGTR has occurred and the crew is performing actions IAW PATH-2.
- Prior to RCS cooldown to target temperature, a NOTE warns against exceeding Steam Line flow rates in excess of the High Steam Line flow setpoint.

What condition is the NOTE written to prevent?

- A. MSIVs isolation on High Steam Line Delta P.
- B. An SI initiation on High Steam Line Delta P.
- C. An SI initiation on High Steam flow coincident with Low T_{AVG} .
- D. MSIVs isolation on High Steam flow coincident with Low T_{AVG} .

The correct answer is D.

Rapid RCS cooldown is expected during this event, cooldown rates will be exceeded. The note provides a warning that the Main Steam Line Isolation actuation will still occur if High Steam Line flow setpoints are exceeded during the RCS rapid cooldown.

- A: Incorrect - MSIV isolation does NOT occur from High Steam Line Delta P signal.
- B: Incorrect - SI initiation will occur from High Steam Line Delta P signal during normal conditions. During this evolution in PATH-2, SI has already been blocked by the Low PZR Pressure / High Steam Line Delta P manual block switch.
- C: Incorrect - SI setpoint will be exceeded, however SI is blocked IAW actions of PATH-2 prior to commencing RCS cooldown.
- D: Correct - MSIVs will isolate if the setpoint is exceeded, potentially stopping the cooldown if the crew is using Condenser Steam Dumps.

Exam Question Number: 39

Reference: PATH-2, Grid locations D-2 and D-3; PATH-2 BD, Pages 69-70.

KA Statement: Knowledge of the operational implications of EOP warnings, cautions, and notes.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

40. 059 A2.05 001/MAIN FEEDWATER/2/1/3.1/3.4/RO/LOW/N/A/NEW - 2008/FW-007
Given the following:

- The plant is operating at 50% RTP for maintenance on MFP "B".
- The following Main Feedwater Pump "A" parameters are reported:
 - Feed pump suction pressure is 225 PSIG.
 - DP indication on FS-1444A equates to Main Feedwater Pump Flow of 2850 GPM.

What is the expected response of the Feedwater System and what actions are required IAW AOP-010, MAIN FEEDWATER/CONDENSATE MALFUNCTION.?

MFP "A" will...

- A. trip on low suction pressure ONLY, trip the Reactor and enter PATH-1.
- B. trip on low suction pressure coincident with low flow, trip the Reactor and enter PATH-1.
- C. remain running; verify FCV-1444, MFP "A" RECIRC VALVE is OPEN.
- D. remain running; verify HCV-1459, FEEDWATER HEATER BYPASS is OPEN.

The correct answer is B.

- A: Incorrect - Symptoms of a FWP suction line break. Both setpoints needed for FWP trip. Enter AOP-010.
- B: Correct - Main Feedwater Pump will trip on low suction pressure coincident with low flow. With NO feedwater pumps operating, proper action is to trip the reactor and enter PATH-1.
- C: Incorrect - MFP trips, therefore first part is incorrect. FCV-1444 OPENS at 1475 GPM and CLOSES at 3100 GPM.
- D: Incorrect - MFP trips, therefore first part is incorrect. HCV-1459 OPENS at 300 PSIG MFP suction pressure. HCV-1459 will be OPEN in an attempt to supply the MFP more flow.

HLC-08 NRC Written Exam

Exam Question Number: 40

Reference: APP-007-B3 and D5; AOP-010, Page 3.

KA Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Rupture in the MFW suction or discharge line.

History: New - Written for HLC-08 NRC exam

FINAL

HLC-08 NRC Written Exam

41. 061 A3.01 001/AFW/2/1/4.2/4.2/RO/HIGH/N/A/RNP AUDIT - 2001/AFW-008

Given the following:

- The plant is operating at 30% RTP.
- A loss of the Startup Transformer occurs concurrent with a Reactor Trip and Safety Injection.
- All S/G levels indicate approximately 20%.

Which ONE (1) of the following describes the AFW system status?

- A. MDAFW Pumps ONLY are running at 325 GPM each.
- B✓ MDAFW Pumps are running at 325 GPM each AND SDAFW Pump is running at 500 GPM.
- C. MDAFW Pumps ONLY are running at 300 GPM each.
- D. MDAFW Pumps are running at 300 GPM each AND SDAFW Pump is running at 630 GPM.

The correct answer is B.

There are 2 pieces of information required to answer this question correctly. The MDAFW Pumps started from the SI sequencer and the SDAFW Pump started from the undervoltage signal from 4160V Busses 1 and 4.

- A: Incorrect - MDAFW Pumps are operating at 325 GPM each. The SDAFW Pump started from the undervoltage signal of 4160V Busses 1 and 4.
- B: Correct - MDAFW Pumps are operating at 325 GPM each and were started from the SI sequencer after 480V Busses E-1 and E-2 were energized from their respective EDG. SDAFW Pump started from the undervoltage signal from 4160V Busses 1 and 4 and is operating at 500 GPM.
- C: Incorrect - MDAFW Pumps and SDAFW Pump are operating. MDAFW Pumps are operating at 325 GPM, NOT 300 GPM. 300 GPM is the minimum flow required for Heat Sink requirements in the CSFSTs.
- D: Incorrect - MDAFW Pumps and SDAFW Pump are operating. MDAFW Pumps are operating at 325 GPM, NOT 300 GPM. 300 GPM is the minimum flow required for Heat Sink requirements in the CSFSTs. SDAFW Pump is operating at 500 GPM. 630 GPM is the flow restriction setpoint for the cavitating venturi on the discharge of the SDAFW Pump to limit flow to a faulted S/G.

HLC-08 NRC Written Exam

Exam Question Number: 41

Reference: Heat Sink CSFST, SD-042, AFW, Page 15.

KA Statement: Ability to monitor automatic operation of the AFW, including: AFW startup and flows.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

42. 062 K2.01 001/AC ELECTRICAL DIST/2/1/3.3/3.4/RO/LOW/N/A/NEW - 2008/CW-007

Which ONE (1) of the following describes the power supplies for the Circulating Water Pumps?

- A. CW Pump "A" - 4KV Bus 1
CW Pump "B" - 4KV Bus 2
CW Pump "C" - 4KV Bus 3
- B. CW Pump "A" - 4KV Bus 5
CW Pump "B" - 4KV Bus 4
CW Pump "C" - 4KV Bus 1
- C. CW Pump "A" - 4KV Bus 2
CW Pump "B" - 4KV Bus 3
CW Pump "C" - 4KV Bus 4
- D. CW Pump "A" - 4KV Bus 1
CW Pump "B" - 4KV Bus 4
CW Pump "C" - 4KV Bus 5

The correct answer is D.

A: Incorrect - CW Pump "A" is powered from 4KV Bus 1, CW Pump "B" is powered from 4KV Bus 4, CW Pump "C" is powered from 4KV Bus 5.

B: Incorrect - CW Pump "A" is powered from 4KV Bus 1, CW Pump "B" is powered from 4KV Bus 4, CW Pump "C" is powered from 4KV Bus 5.

C: Incorrect - CW Pump "A" is powered from 4KV Bus 1, CW Pump "B" is powered from 4KV Bus 4, CW Pump "C" is powered from 4KV Bus 5.

D: Correct - CW Pump "A" is powered from 4KV Bus 1, CW Pump "B" is powered from 4KV Bus 4, CW Pump "C" is powered from 4KV Bus 5.

Exam Question Number: 42

Reference: EDP-001, Pages 4, 7 and 8; SD-057, CW, Page 10.

KA Statement: Knowledge of bus power supplies to the following: Major system loads.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

43. 063 K3.02 001/DC ELECT DIST/2/1/3.5/3.7/RO/LOW/N/A/RNP AUDIT - 2001/KVAC-006
ONE (1) minute following a Reactor Trip, BOTH 52/8, SOUTH OCB and 52/9, NORTH OCB breakers remain CLOSED.

Which ONE (1) of the following describes the failure that caused BOTH of these breakers to remain CLOSED?

- A. Loss of DC Bus "A".
- B✓ Loss of DC Bus "B".
- C. Loss of the Auxiliary Panel DC.
- D. Loss of the Auxiliary Panel GC.

The correct answer is B.

A: Incorrect - OCB 52/8 and OCB 52/9 receive their control power from DC Bus B.

B: Correct - OCB 52/8 and OCB 52/9 receive their control power from DC Bus B

C: Incorrect - Loss of Auxiliary Panel DC deenergizes numerous loads from DC Bus A but Unit OCBs 52/8 and 52/9 are fed from DC Bus B.

D: Incorrect - Loss of Auxiliary Panel GC deenergizes numerous loads from DC Bus B but Unit OCBs 52/8 and 52/9 are fed directly from a breaker on DC Bus B instead of from Auxiliary Panel GC.

Exam Question Number: 43

Reference: SD-039, KVAC, Page 11; EPP-27, Pages 3-4; EPP-27 BD, Page 4.

KA Statement: Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: Components using DC control power.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

44. 064 G2.1.7 001/EMERG DIESEL GEN/2/1/4.4/4.7/RO/HIGH/N/A/NEW - 2008/EDG-007
Given the following:

- The plant is operating at 100% RTP.
- 480V Bus E-1 Main Breaker trips on overcurrent.
- EDG "A" starts and re-energizes 480V Bus E-1.
- The EDG "A" Jacket Water Coolant Pump shaft shears during EDG start.
- APP-010-F2, EDG A COOL WTR HI/LO TEMP illuminates.
- APP-010-A2, EDG A TROUBLE illuminates.

Which ONE (1) of the following is the impact of the pump shaft failure on EDG Automatic operation?

EDG "A" will....

- A. shutdown when coolant water pressure decreases to 9 PSIG.
- B. shutdown when coolant water temperature reaches 205 °F.
- C. continue to operate due to ALL EDG engine trips being defeated.
- D. continue to operate due to run priority from the Undervoltage start.

The correct answer is C.

A: Incorrect - With the EDG in a standby condition, the engine trips (9 PSIG is an actual engine trip setpoint) are defeated to prevent spurious trips from affecting the EDG operation during emergency conditions.

B: Incorrect - With the EDG in a standby condition, the engine trips (205 °F is an actual engine trip) are defeated to prevent spurious trips from affecting the EDG operation during emergency conditions.

C: Correct - Diesel engine trips are defeated to prevent spurious trips during emergency operation and the EDG will continue to run.

D: Incorrect - EDG starts on Undervoltage, however UV has no input to engine trips or run priority.

Exam Question Number: 44

Reference: OP-604, Page 8, Step 3.11; SD-005, EDG, Pages 30-31.

KA Statement: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

History: New - Written for HLC-08 NRC Exam.

FINAL



HLC-08 NRC Written Exam

45. 073 A4.01 001/PROCESS RAD MONITOR/2/1/3.9/3.9/RO/HIGH/N/A/RNP AUDIT - 2006/RMS-009
Given the following:

- The plant is operating at 100% RTP.
- A release of Waste Condensate Tank (WCT) "A" is in progress.
- APP-036-E7, RAD MONITOR TROUBLE, is received.
- The BOP Operator reports the FAIL light for R-18, LIQUID WASTE DISPOSAL EFFLUENT monitor, is ON.

Which ONE (1) of the following describes the status of RCV-018, LIQUID WASTE RELEASE ISOLATION VALVE?

RCV-018 will...

- A✓ NOT automatically close. The release must be manually terminated from the Waste Disposal Panel.
- B. automatically close, and R-18 Rad Monitor must be reset to reopen.
- C. NOT automatically close, and must be CLOSED manually from the RTGB.
- D. automatically close, and must be reset by cycling the valves controller.

The correct answer is A.

- A: Correct - The FAIL light means the detector has undergone a loss of power and/or loss of indication. The valve will NOT close upon receipt of a FAIL light, and the release must be manually terminated from the local station (Waste Disposal Panel).
- B: Incorrect - RCV-018 will close on a High Radiation Alarm, NOT a FAIL light.
- C: Incorrect - RCV-018 can be operated at any time with control switch on the Waste Disposal Panel, but CANNOT be operated from the RTGB in the Control Room.
- D: Incorrect - RCV-018 will NOT Automatically CLOSE and is controlled by the CLOSE-AUTO-OPEN switch instead of a valve controller (regulator adjustment). RCV-014, Waste Gas Decay Tank Gaseous Release valve, is controlled by a valve controller (regulator adjustment) located on the Waste Disposal Panel.

Exam Question Number: 45

Reference: SD-019, RMS, Page 40; APP-036-E7.

KA Statement: Ability to manually operate and/or monitor in the control room: Effluent release.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

46. 076 A2.01 001/SERVICE WATER/2/1/3.5/3.7/RO/LOW/N/A/NEW - 2008/AOP-022-003
Given the following:

- The plant is operating at 100% RTP.
- APP-008-E8, N SW HDR STRAINER PIT HI LVL has illuminated.
- APP-008-F8, NORTH SW HDR LO PRESS has illuminated.

Which ONE (1) of the following are Immediate Actions IAW AOP-022, LOSS OF SERVICE WATER?

- A. Close V6-12D, NORTH SW HEADER ISOLATION VALVE, then Go to Section F, SERVICE WATER PITS FLOODING IN INTAKE AREA.
- B. Close V6-12B AND V6-12C, SW X-CONN Valves, then Go to Section F, SERVICE WATER PITS FLOODING IN INTAKE AREA
- C. Close V6-12B AND V6-12C, SW X-CONN Valves, then Go to EPP-28, LOSS OF ULTIMATE HEAT SINK.
- D. Close V6-12D, NORTH SW HEADER ISOLATION VALVE, then Go to EPP-28, LOSS OF ULTIMATE HEAT SINK.

The correct answer is B.

- A: Incorrect - V6-12D is closed later in the procedure (after the Immediate Actions) after closing V6-12B and V6-12C for header separation.
- B: Correct - Step 1 of AOP-022 is an Immediate Action step. (1) Check APP-008-E8, N SW HDR STRAINER PIT HI LVL extinguished. (RNO) Then immediately close V6-12B and V6-12C and transition to Section F.
- C: Incorrect - Closing the X-connect valves is an Immediate Action Step within AOP-022 to separate the headers, however transitioning to EPP-28 is ONLY required if NO SW is available.
- D: Incorrect - Closing V6-12D is an action within AOP-022, but it is NOT an Immediate Action and transitioning to EPP-28 is ONLY required if NO SW is available..

Exam Question Number: 46

Reference: AOP-022, Pages 3, 4 and 38; APP-008-E8; APP-008-F8.

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

History: New - Written for HLC-08 NRC Exam.

FINAL



HLC-08 NRC Written Exam

47. 078 K1.03 001/INSTRUMENT AIR/2/1/3.3/3.4/RO/LOW/N/A/NEW - 2008/PZR-010

Given the following:

- A line break on the Instrument Air header inside Containment has resulted in a full depressurization of Containment Instrument Air.
- The crew has closed PCV-1716, INSTRUMENT AIR TO CONTAINMENT.

Based on the above conditions, which ONE (1) of the following can be operated from the RTGB?

- A. Pressurizer Spray valves.
- B. Pressurizer PORVs.
- C. Letdown Line Isolation valves.
- D. Charging Line Isolation valves

The correct answer is B.

A: Incorrect - PZR Spray Valves use Instrument Air as motive force. Valves have failed CLOSED.

B: Correct - PZR PORVs use Nitrogen from SI Accumulator fill line and have a dedicated Nitrogen Accumulator for each valve. Instrument Air serves as backup.

C: Incorrect - Letdown line isolation valves use Instrument Air and ALL fail CLOSED.

D: Incorrect - CVC-310A and 310B fail OPEN. CVC-311 fails CLOSED. ALL charging line isolations CANNOT be operated from the RTGB without Instrument Air.

Exam Question Number: 47

Reference: AOP-017, Attachment 1, Pages 34, 36; SD-059, PZR, Page 10 and Figure 4.

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: Containment air.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

48. 103 K3.01 001/CONTAINMENT/2/1/3.3/3.7/RO/LOW/N/A/NEW - 2008/CV-008
Given the following:

- The plant is in MODE 4, cooling down IAW GP-007, PLANT COOLDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN.
- A spurious R-11 alarm causes a CV Ventilation Isolation signal.
- V12-8 and V12-9, CV PURGE OUTLET VALVES, both have dual OPEN/CLOSED indications.

Which ONE (1) of the following, if any, is required to satisfy LCO 3.6.3, CONTAINMENT ISOLATION VALVES?

- A✓ Close and deactivate EITHER V12-8 OR V12-9 within 1 hour.
- B. Close and deactivate BOTH V12-8 AND V12-9 within 1 hour.
- C. Override EITHER V12-8 OR V12-9 CLOSED within 1 hour, using CV Purge Valve blocking mechanism.
- D. Plant is in MODE 4; No action required.

The correct answer is A.

- A: Correct - ITS 3.6.3, CONTAINMENT ISOLATION VALVES, Condition B applies. Either (one) valve must be closed and deactivated within 1 hour to meet ITS requirements.
- B: Incorrect - Only 1 valve must be closed/deactivated in each line.
- C: Incorrect - Blocking mechanisms only block the valves OPEN.
- D: Incorrect - CV isolation required in MODES 1,2,3 and 4 for Containment integrity to be met.

Exam Question Number: 48

Reference: ITS 3.6.3; OP-921, Page 49.

KA Statement: Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under shutdown conditions.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

49. 004 K3.08 001/CVCS/2/1/3.6/3.8/RO/LOW/N/A/NEW - 2008/CVCS-008

Given the following:

- Charging Pump "A" is being recirculated following maintenance.
- During the restoration, CVC-291, CHARGING PUMP "A" TO SEAL INJECTION Valve was opened prior to closing CVC-277C, CHARGING PUMP "A" RECIRC ROOT valve.

Which ONE (1) of the following is the impact on the CVC System?

- A. This operation will have NO effect on the CVC System.
- B. ONLY Charging flow on FI-122A decreases to minimum.
- C. ONLY Seal Injection on FI-124, FI-127 and FI-130 decreases to minimum.
- D. Seal Injection on FI-124, FI-127 and FI-130 AND Charging flow on FI-122A decreases to minimum.

The correct answer is D.

There are 2 parallel discharge isolation valves on each charging pump. Normal operation has both valves open, 1 supplying the charging header and 1 supplying the seal injection line to the RCPs. With the recirc valve open on a charging pump, the flow path is back to the VCT. With the recirc valve open while the pump discharge valve is open, all charging and seal injection flow will follow the path of least resistance and return to the VCT.

- A: Incorrect - All charging and seal injection flow will take the path of least resistance and return to the VCT.
- B: Incorrect - The charging line flow will decrease to minimum but the seal injection flow to the RCPs will also decrease to minimum.
- C: Incorrect - The seal injection flow to the RCPs will decrease to minimum but the charging line flow will also decrease to minimum.
- D: Correct - ALL charging pump discharge flow (charging line flow and seal injection to the RCPs) will decrease to minimum with all of the flow returning to the VCT through the charging pump recirc line path.

Exam Question Number: 49

Reference: CVCS OP-301-1, Section 8.4.1.

KA Statement: Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: RCP seal injection.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

50. 007 A1.02 001/PRT/QUENCH TANK/2/1/2.7/2.9/RO/HIGH/N/A/NEW - 2008/PZR-008

Given the following:

- The plant is operating at 100% RTP.
- PCV-455C, PZR PORV was leaking by and has caused the following conditions in the PRT:
 - APP-003-C3, PRT HI PRESS illuminates and PRT pressure is 6 PSIG.
 - PRT level is 69% and stable.
 - PRT Temperature is 115 °F and stable.

Which ONE (1) of the following actions would be used to reduce PRT pressure IAW OP-103, PRESSURIZER RELIEF TANK CONTROL SYSTEM?

- A. Open RC-523, PRT DRAIN, to reduce pressure to 1-2 PSIG.
- B✓ Open RC-549, PRT VENT, to reduce pressure to 3-5 PSIG.
- C. Open RC-523, PRT DRAIN, to reduce pressure to 3-5 PSIG.
- D. Open RC-549, PRT VENT, to reduce pressure to 1-2 PSIG.

The correct answer is B.

- A: Incorrect - With the PRT level at the minimum level, opening the PRT drain valve is NOT the correct solution. The PRT pressure range is 3-5 PSIG, NOT 1-2 PSIG.
- B: Correct - With the PRT level at the minimum level and PRT temperature stable and within the normal temperature limits, opening the PRT vent valve to establish 3-5 PSIG is the correct response.
- C: Incorrect - With the PRT level at the minimum level, opening the PRT drain valve is NOT the correct solution. The PRT pressure range of 3-5 PSIG is correct.
- D: Incorrect - With the PRT level at the minimum level and PRT temperature stable and within the normal temperature limits, opening the PRT vent valve is the proper action. Establishing a pressure band of 1-2 PSIG is incorrect, it should be 3-5 PSIG.

Exam Question Number: 50

Reference: APP-003-C3; SD-018, Compressed Gas, Pages 19-20, Figure 2.

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

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

51. 039 K1.01 001/MAIN/REHEAT STEAM/2/1/3.1/3.2/RO/LOW/N/A/NEW - 2008/SGS-004

Which ONE (1) of the following describes the design feature(s) which act to limit S/G blowdown rate for a Steam Break accident?

- A. Swirl Vane Separators in the upper S/G internals.
- B✓ A set of 7 venturis within each S/G outlet nozzle.
- C. A Steam Flow venturi in each Main Steam line, located at the operating floor.
- D. MSIVs are required to close within 5 seconds.

The correct answer is B.

A: Incorrect - Swirl vanes are designed to impart radial motion to the steam to remove moisture.

B: Correct - S/G Steam nozzles are provided with flow limiting devices to restrict the steam flow resulting from a Steam Line Break.

C: Incorrect - A single Steam Flow venturi is located in each Main Steam line, at the operating floor level adjacent to the S/G, to produce a small delta P relative to steam flow as a means of measuring flow. Pressure drop (and the flow limiting effect) is designed to be small for efficiency reasons.

D: Incorrect - MSIV closure time would have NO effect on UPSTREAM breaks.

Exam Question Number: 51

Reference: SD-025, Main Steam, Page 9, Figure 1; SD-048, S/G, Page 8, Figures 4 and 8.

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

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

52. 062 A3.05 001/AC ELECTRICAL DIST/2/1/3.5/3.6/RO/HIGH/N/A/RNP AUDIT - 2001/AOP-024-004
Given the following:

- A Loss of Instrument Bus 1 has occurred.
- The crew is performing actions contained in AOP-024, LOSS OF INSTRUMENT BUS.
- The Pressurizer Pressure Controller (PC-444J) AUTO light illuminates for approximately 15 seconds, then extinguishes, and then the MANUAL light is illuminated.

Which ONE (1) of the following correctly describes the status of Instrument Bus 1 and method of control?

- A. Instrument Bus 1 power is NOT restored. Operate Pressurizer Heaters and Spray valves manually.
- B. Instrument Bus 1 power is restored. PC-444J AUTO control has failed, continue to operate in MANUAL.
- C. Instrument Bus 1 power is restored. Restore PC-444J to AUTO control.
- D. Instrument Bus 1 power is NOT restored. Continue to operate PC-444J in MANUAL.

The correct answer is C.

- A: Incorrect - Instrument Bus 1 power has been restored. The controller has NOT failed, it indicated that power has been restored to the Instrument Bus.
- B: Incorrect - Power has been restored to PC-444J which operated through its normal power restoration cycle. The controller does NOT automatically swap to the AUTO mode.
- C: Correct - When power is restored to PC-444J, the AUTO indicator will flash indicating power is returned to the normal mode. The controller will stay in MANUAL control. Operator action is required IAW AOP-024 to restore controller to AUTO.
- D: Incorrect - Power is restored. Power restoration will leave the controller in MANUAL. Controller can be operated in MANUAL or AUTO while on alternate power source.

Exam Question Number: 52

Reference: AOP-024, Page 5; OP-001, Pages 23-25.

KA Statement: Ability to monitor automatic operation of the ac distribution system, including:
Safety-related indicators and controls.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

53. 039 K3.06 001/MAIN/REHEAT STEAM/2/1/2.8/3.1/RO/HIGH/N/A/RNP BANK/EPP-11-005
Given the following:

- The plant is operating at 100% RTP.
- The Reactor Operator reports the following:
 - RCS Temperature is lowering rapidly.
 - RCS Subcooling is increasing.
 - Pressurizer level is lowering rapidly.
- A Reactor Trip and Safety Injection occurs.

- Containment pressure is now reported as 11 PSIG and increasing.

Which ONE (1) of the following describes the event in progress and the current status of the Condenser Steam Dumps?

- A. Steam Line Break;
Condenser Steam Dumps are available.
- B. Large Break LOCA;
Condenser Steam Dumps are available.
- C. Steam Line Break;
Condenser Steam Dumps are NOT available.
- D. Large Break LOCA;
Condenser Steam Dumps are NOT available.

The correct answer is C.

- A: Incorrect - Condenser Steam Dumps are NOT available due to Phase B isolation closing the MSIVs.
- B: Incorrect - RCS temperature indication shows that a Steam Line break has occurred.
- C: Correct - Steam Dumps are NOT available due to the MSIV closure when the Phase B signal was generated.
- D: Incorrect - RCS temperature indication shows that a steam line break has occurred.

Exam Question Number: 53

Reference: Supplement G, Page 37; SD-031, Steam Dump, Pages 8, 9 and 19.

KA Statement: Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: SDS.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

54. 026 A2.04 001/CTMT SPRAY/2/1/3.9/4.2/RO/HIGH/N/A/NEW - 2008/
Given the following:

- A LOCA has occurred coincident with a loss of the Startup Transformer.
- EDG "A" has failed to start.
- The crew is performing actions IAW PATH-1.
- Containment pressure is at 12 PSIG and increasing.
- CV Spray Pump "B" was inadvertently stopped.

Which ONE (1) of the following describes the status of CV Spray Pump "B"?

- A. The pump will restart because CV pressure is above 10 PSIG.
- B. The pump is stopped, but can be manually restarted by taking the switch to START.
- C. The pump is locked out and can be restarted by placing the Containment Spray Key Switch in the OVRD/RESET Position.
- D. The pump is locked out and can ONLY be restarted if the CV Spray Pump Breaker control power fuses are removed and reinstalled.

HLC-08 NRC Written Exam

The correct answer is C.

The CV Spray system actuates at 10 PSIG in Containment, both CV Spray Pumps auto start. If CV Pressure remains above 10 PSIG, stopping CV Spray Pumps would prevent them from being operated from the RTGB, (they would be "locked out"). In order to restart CV Spray Pumps, an operator would have to go to the pump breaker and physically remove control power fuses to reset the control circuit. To allow continued operation from the RTGB, if CV Pressure is > 10 PSIG, the Containment Spray Key Switch must be placed in the OVRD/RESET position. This allows manual operation of both CV Spray Pumps from the RTGB if CV Pressure is > 10 PSIG.

- A: Incorrect - Resetting SI is a procedure Step to allow for control of AFW, but does NOT have any effect on operation of the CV Spray Pumps if CV Pressure is > 10 PSIG.
- B: Incorrect - Resetting SI, Phase A and Phase B are procedure Steps within the EOP network, but they do NOT have any effect on operation of the CV Spray Pumps if CV Pressure is > 10 PSIG. CV Spray must be reset prior to resetting Phase B to allow Phase B to reset.
- C: Correct - When CV pressure remains higher than 10 PSIG, the signal must be overridden to allow CV Spray Pump to be stopped and NOT locked out.
- D: Incorrect - Resetting SI does NOT have any effect on reset of CV Spray. Unless the Key Switch remains in the OVRD position CV Spray Pump will be locked out due to CV pressure remaining > 10 PSIG. Momentarily placing the key switch to OVRD/RESET will NOT allow the CV Spray Pumps to be operated without being locked out.

Exam Question Number: 54

Reference: SD-024, CONTAINMENT SPRAY SYSTEM, Pages 16-17.

KA Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of spray pump.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

55. 064 K6.07 001/EMERG DIESEL GEN/2/1/2.7/2.9/RO/LOW/N/A/NEW - 2008/EDG-009
Given the following:

- A leak in the EDG "A" Air Start Receiver is reducing starting air pressure.

Which ONE (1) of the following is the FIRST pressure at which the EDG Air Receiver LCO is entered?

- A. < 100 PSIG.
- B. < 210 PSIG.
- C. < 216 PSIG.
- D. < 220 PSIG.

The correct answer is B.

A: Incorrect - < 100 PSIG requires entry into LCO 3.8.3, Condition E and requires the associated EDG to be declared inoperable immediately. LCO 3.8.3 Condition D is entered when starting air receiver pressure decreases to < 210 PSIG, which is the FIRST LCO entry.

B: Correct - LCO 3.8.3, Condition D is entered when pressure is < 210 PSIG and \geq 100 PSIG.

C: Incorrect - 216 PSIG is the AIR START LO PRESS alarm setpoint.

D: Incorrect - 220 PSIG is the START pressure setpoint for Air Start Compressor in AUTO.

Exam Question Number: 55

Reference: ITS 3.8.3, Condition D; ITS Bases 3.8.3, D1; SD-005, EDG, Page 27.

KA Statement: Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Air receivers.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

56. 002 K6.07 001/REAC COOLANT/2/2/2.5/2.8/RO/LOW/N/A/BYRON-2003/THERMO CHAP 8-014
Given the following:

- The plant has been restarted following a forced outage.
- Loop flow measurements have determined that RCP "B" impeller has degraded such that its RCS loop flow has DECREASED by 5% from its original value.
- The other RCS loop flows remain UNCHANGED.

Which ONE (1) of the following would be a result of the decreased flow rate in Loop "B"?

- A. Demand on the PZR Control Group heaters at 2235 PSIG will be lower.
- B. The reactor core will operate closer to DNB when at full power.
- C. Core Delta-T at full power will be lower.
- D. The reactor core will operate further from DNB when at full power.

The correct answer is B.

- A: Incorrect - RCPs "B" and "C" supply PZR spray valves. However, based on plant design, RCP "B" provides limited flow, plus under steady state/2235 PSIG conditions, the spray valves are closed and bypasses provide minimal flow to keep the lines warm - NOT an impact on current draw on the PZR Control Group heaters.
- B: Correct - Putting out the same MWt with a reduced flow rate means reduced heat transfer capabilities and therefore operation CLOSER to DNB.
- C: Incorrect - Delta-T should actually be higher in this situation.
- D: Incorrect - Mass flow rate reduction for the same power results in operation CLOSER to DNB.

Exam Question Number: 56

Reference: Thermodynamics, Chapter 8, Pages 40-41.

KA Statement: Knowledge of the effect or a loss or malfunction on the following RCS components: Pumps.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

57. 014 K1.01 001/ROD POSITION INDICAT/2/2/3.2/3.6/RO/LOW/N/A/NEW - 2008/IRPI-007
During withdrawal of the Control Banks, APP-005-F2, ROD BOTTOM / ROD DROP will CLEAR when Control Bank "A" reaches ...

- A. 20 steps as sensed by the Pulse To Analog Converter.
- B. 35 steps as sensed by the Pulse To Analog Converter.
- C✓ 20 steps as sensed by the IRPIs.
- D. 35 steps as sensed by the IRPIs.

The correct answer is C.

- A: Incorrect - The P to A converter only inputs to the Rod Bottom Bypass Bistable. Control Bank "A" does NOT have Rod Bottom Bypass Bistable.
- B: Incorrect - The P to A converter only inputs to the Rod Bottom Bypass Bistable. Control Bank "A" does NOT have Rod Bottom Bypass Bistable. Setpoint of 35 steps is for Bypass Bistable setpoint.
- C: Correct - Control Bank "A" does NOT have a Rod Bottom Bypass Bistable. APP-005-F2 will clear when ALL Control Bank "A" RBLs clear at 20 steps.
- D: Incorrect - Control Bank "A" does NOT have Rod Bottom Bypass Bistable. 35 steps is the Rod Bottom Bypass Bistable setpoint.

Exam Question Number: 57

Reference: SD-009, IRPI, Pages 16, 17 and Figure 2; APP-005-F2.

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between the RPIS and the following systems: CRDS.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

58. 015 K4.01 001/NUCLEAR INSTRUMENT/2/2/3.1/3.3/RO/HIGH/N/A/NEW - 2008/NIS-010
During MODE 6, I&C requests permission to remove two (2) Power Range NI Channels from service at the same time to expedite calibrations.

What impact, if any, will this have on NI System operations?

Simultaneously removing two (2) Power Range Channels from service will...

- A. have no impact. All trip and interlock signals from the Power Ranges are blocked during the shutdown and prior to entry into MODE 6.
- B. insert a P-10 signal which will de-energize both Source Ranges.
- C. initiate a Reactor Trip signal, which will result in a Feedwater Isolation Signal being generated.
- D. have no impact. Power Range Channels are not required to be OPERABLE in MODE 6, and Source Ranges and Gammametrics provide full range core monitoring.

The correct answer is B.

A: Incorrect - Trip and interlock signals are NOT all blocked during the shutdown.

B: Correct - De-energizing 2 power ranges will initiate a P-10 signal, and de-energize both SRs.

C: Incorrect - A reactor trip signal will be initiated, but in MODE 6, the Rod Drive MG Sets have been placed under clearance to de-energize all of the CRDMs. With $T_{AVG} < 554^{\circ}F$ and the reactor trip breakers open, a feedwater isolation signal has already been generated.

D: Incorrect - While the Power Ranges are not required to be OPERABLE, the NI system interlock circuitry is still functional.

Exam Question Number: 58

Reference: SD-011, RPS, Figure 18.

KA Statement: Knowledge of NIS design feature(s) and/or interlock(s) provide for the following:
Source-Range detector power shutoff at high powers.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

59. 017 K3.01 001/IN-CORE TEMP MONITOR/2/2/3.5/3.7/RO/HIGH/N/A/NEW - 2008/ICCM-005
Given the following:

- Both Inadequate Core Cooling Monitors (ICCM) have been deenergized.
- A Loss of Offsite Power and Reactor Trip occur.
- Natural Circulation conditions are being verified in Supplement E, NATURAL CIRCULATION VERIFICATION.

Which ONE (1) of the following indications verifies that Natural Circulation has been established?

- A. T_{HOT} is decreasing.
 T_{COLD} is stable.
S/G pressure is stable.
- B. T_{HOT} is stable.
 T_{COLD} is decreasing.
S/G pressure is stable.
- C. T_{HOT} is decreasing.
 T_{COLD} is decreasing.
S/G pressure is decreasing.
- D. T_{HOT} is stable.
 T_{COLD} is stable.
S/G pressure is decreasing.

The correct answer is C.

In order to verify Natural Circulation established, three things must be observed; T_{HOT} must be stable or decreasing, T_{COLD} must be decreasing and S/G pressure must be decreasing and saturation pressure must be consistent with RCS temperature.

- A: Incorrect - T_{COLD} and S/G pressure is stable, therefore heat is NOT being removed and NC is NOT verified.
- B: Incorrect - S/G pressure is stable, therefore heat is NOT being removed and NC is NOT verified.
- C: Correct - ALL parameters indicate NC is occurring and verified
- D: Incorrect - T_{HOT} and T_{COLD} are stable which indicates that NC is NOT established.

HLC-08 NRC Written Exam

Exam Question Number: 59

Reference: Supplement E, Page 29; ICCM Figure 1, 27.

KA Statement: Knowledge of the effect that a loss or malfunction of the ITM system will have on the following: Natural circulation indications.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

60. 027 K1.01 001/CTMT IODINE REMOVAL/2/2/3.4/3.7/RO/HIGH/N/A/BRAIDWOOD - 2004/ESF-004
Given the following:

- An RCS LOCA has occurred which resulted in a Containment Spray Actuation.
- ALL ESF equipment has functioned as designed.
- NO ESF signals have been reset.
- Containment pressure is 8 PSIG.

The CRSS has directed that SI-845A, SAT DISCH VLV be CLOSED.

Which ONE (1) of the following action(s) must the crew perform to allow SI-845A to be CLOSED?

Reset...

- A. SI Signal, and then reset the Containment Spray Actuation Signal.
- B. Containment Spray Actuation Signal ONLY.
- C. Containment Isolation Phase B Signal ONLY.
- D. SI Signal, and then reset the Containment Isolation Phase B Signal.

The correct answer is B.

A: Incorrect - SI reset is unnecessary, therefore it is NOT a required action.

B: Correct - CV Spray Actuation can be reset since CV pressure is less than 10 PSIG.

C: Incorrect - Resetting Phase B would have NO effect on CV Spray.

D: Incorrect - Resetting SI and Phase B would have NO effect on CV Spray.

Exam Question Number: 60

Reference: SD-006, ESFAS, Pages 13, 17 and Figure 3.

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between the CIRS and the following systems: CSS.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

61. 034 A4.02 001/FUEL HANDLING EQUIP/2/2/3.5/3.9/RO/LOW/N/A/NEW - 2008/NIS-008
Given the following:

- The plant is in MODE 6.
- Refueling activities are in progress.
- APP-005-C1, SR HI FLUX AT SHUTDOWN is illuminated.

Which ONE (1) of the following describes the High Flux at Shutdown alarm setpoint and the system response?

SR counts are greater than...

- A✓ 3 times All-Rods-In background and the CV Evacuation horn will sound.
- B. 3 times All-Rods-In background and the LOCAL Evacuation alarm will sound.
- C. 2 times All-Rods-In background and the CV Evacuation horn will sound.
- D. 2 times All-Rods-In background and the LOCAL Evacuation alarm will sound.

The correct answer is A.

- A: Correct - High Flux at Shutdown alarm setpoint is set at 3 times the All-Rods-In background count rate to ensure early warning of changing counts. IF the setpoint is exceeded, an automatic initiation of the CV Evacuation Horn will occur.
- B: Incorrect - High Flux at Shutdown alarm setpoint is set at 3 times the All-Rods-In background count rate to ensure early warning of changing counts. There is NO automatic initiation of the LOCAL evacuation alarm.
- C: Incorrect - If SR counts double during any reactivity addition, dilution or rod movement is stopped to ensure positive control over the core. This is an incorrect application of this setpoint.
- D: Incorrect - If SR counts double during any reactivity addition, dilution or rod movement is stopped to ensure positive control over the core. This is an incorrect application of this setpoint. There is NO automatic initiation of the LOCAL evacuation alarm.

Exam Question Number: 61

Reference: GP-002, Page 118; OP-002, Pages 15 and 16; APP-005-C1.

KA Statement: Ability to manually operate and/or monitor in the control room: Neutron levels.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

62. 035 A2.06 001/STEAM GENERATOR/2/2/4.5/4.6/RO/LOW/N/A/NEW - 2008/PATH-1-005

Given the following:

- The plant was operating at 100% RTP when a Small Break LOCA occurred.
- Safety Injection has been actuated.
- RCPs were tripped due to loss of subcooling.
- Containment pressure is at 4.5 PSIG.

Which ONE (1) of the following describes the REQUIRED action IAW PATH-1 to ensure that core cooling is maintained during this event?

- A. Maintain ALL S/G levels > 8%.
- B✓ Maintain ONE S/G level > 18%.
- C. Maintain ALL S/G levels > 18%.
- D. Maintain ONE S/G level > 8%.

The correct answer is B.

A: Incorrect - Maintaining ALL S/Gs > 8% level is NOT required to maintain a minimum heat sink requirements. Maintaining at least 1 S/G level > 8% is the minimum requirement when CV adverse numbers are NOT applicable. Maintaining 1 S/G level > 18% (CV adverse numbers due to CV pressure being > 4 PSIG) ensures Secondary Heat Sink is maintained as long as RCS pressure is greater than S/G pressure. Maintaining 1 S/G level > 8% would be correct if CV adverse numbers did NOT apply.

B: Correct - Maintaining 1 S/G level > 18% (CV adverse numbers due to CV pressure being > 4 PSIG) ensures Secondary Heat Sink is maintained as long as RCS pressure is greater than S/G pressure.

C: Incorrect - Maintaining 1 S/G level > 18% (CV adverse numbers due to CV pressure being > 4 PSIG) ensures Secondary Heat Sink is maintained as long as RCS pressure is greater than S/G pressure. Maintaining ALL S/Gs > 18% level is NOT required.

D: Incorrect - Maintaining 1 S/G level > 18% (CV adverse numbers due to CV pressure being > 4 PSIG) ensures Secondary Heat Sink is maintained as long as RCS pressure is greater than S/G pressure. Maintaining 1 S/G level > 8% would be correct if CV adverse numbers did NOT apply.

HLC-08 NRC Written Exam

Exam Question Number: 62

Reference: PATH-1 BD, Page 37; FRP-H.1 BD, Page 45.

KA Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the GS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Small break LOCA.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

63. 041 A4.06 001/STM DUMP/TURB BYPASS/2/2/2.9/3.1/RO/HIGH/N/A/SALEM - 2001/PATH-2-005
Given the following:

- A Steam Generator Tube Rupture has occurred.
- The crew is preparing to cooldown to a target temperature of 480 °F IAW PATH-2.
- A Loss of Off-Site Power occurs.
- All equipment functions as required.

Which ONE (1) of the following describes how the cooldown to target temperature will be accomplished?

- A. Intact S/G PORVs controllers set to 6.2 (553 PSIG).
- B. Steam Dumps in Pressure Control mode set to 3.95 (553 PSIG).
- C. Intact S/G PORVs controllers set to maintain full OPEN valve position.
- D. Steam Dumps in Pressure Control mode set to maximum rate.

The correct answer is C.

- A: Incorrect - Setting S/G PORVs to 553 PSIG will cooldown the plant, but will throttle closed on the valves as the target temperature and pressure is being approached instead of maintaining the maximum cooldown rate until the target temperature is reached.
- B: Incorrect - Condenser Steam Dumps are unavailable due to loss of Condenser from LOOP. Setpoint is the target temperature saturation pressure.
- C: Correct - Steam Line PORVs on intact S/Gs are set to maximum rate. Condenser Steam Dumps are unavailable due to LOOP.
- D: Incorrect - Steam Dumps are unavailable due to loss of Condenser from LOOP.

Exam Question Number: 63

Reference: PATH-2 BD, Page 7.

KA Statement: Ability to manually operate and/or monitor in the control room: Atmospheric relief valve controllers.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

64. 045 K1.18 001/MAIN TURBINE GEN/2/2/3.6/3.7/RO/LOW/N/A/NEW - 2008/RPS-006

Which ONE (1) of the following describes how the Reactor Protection System provides Runback signals to the Turbine Generator?

The RPS initiates a Turbine (1) runback when 2/3 OT Delta T (2) 2/3 OP Delta T signals reach their runback setpoints.

- A✓ (1) Reference
(2) OR
- B. (1) Valve Limiter
(2) OR
- C. (1) Reference
(2) AND
- D. (1) Valve Limiter
(2) AND

The correct answer is A.

A: Correct - Turbine Reference runbacks operate from 2/3 OT Delta T OR 2/3 OP Delta T on a 30 second timer. Runback signal is ON for 1.5 seconds and OFF for 28.5 seconds until runback signal clears.

B: Incorrect - No valve limiter runback exists.

C: Incorrect - Reference runback from 2/3 OT Delta T OR 2/3 OP Delta T, does NOT require BOTH.

D: Incorrect - No valve limiter runback exists.

Exam Question Number: 64

Reference: SD-011, RPS, Page 23, Figure 15.

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between the MT/G system and the following systems: RPS.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

65. 075 K2.03 001/CIRCULATING WATER/2/2/2.6/2.7/RO/HIGH/N/A/RNP AUDIT - 2001/SW-009
Given the following:

- EPP-1, LOSS OF ALL AC POWER, is being performed.
- The RCS has been isolated.
- The Inside AO and maintenance technicians are working on starting an EDG.
- There is NO SI signal present or required.

Subsequently, EDG "A" was started.

Which ONE (1) of the following actions is necessary following the energization of 480V Bus E-1?

Verify Service Water Pumps ...

- A✓ "A" and "B" are running.
- B. "A" and "C" are running.
- C. "B" and "D" are running.
- D. "C" and "D" are running.

The correct answer is A.

A: Correct - "A" and "B" now have power available and should be verified started.

B: Incorrect - "A" now has power available and should be verified started. "C" does NOT have power.

C: Incorrect - "B" now has power available and should be verified started. "D" does NOT have power.

D: Incorrect - "C" and "D" do NOT have power.

Exam Question Number: 65

Reference: EDP-002, Page 11; SD-004, SW, Page 21.

KA Statement: Knowledge of bus power supplies to the following: Emergency/essential SWS pumps.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

66. G2.1.26 001/CONDUCT OF OPERATION/3/3.4/3.6/RO/LOW/N/A/NEW - 2008/GET-FALL PROT
Given the following:

- Operators are performing valve lineups to support BOP Flush.
- Several valves above Heater Drain Tank "B" are to be repositioned.
- The valves are approximately 15 feet above the floor level.

In accordance with SAF-NGGC-2172, what fall protection or safety measure(s) is/are required to perform the valve manipulations safely?

- A. Tie or secure an extension ladder to structural components at BOTH the top and bottom, use 3-point contact while on the ladder.
- B. Don a full body harness and attach it to the Extraction Steam line support or snubber rods.
- C. Secure a step ladder to a structural component at the bottom, use 3-point contact while on the ladder.
- D. Don a full body harness and attach it to an approved anchorage point.

The correct answer is D.

- A: Incorrect - Procedure requires that extension ladder be attached to structural components at the top of the ladder while the ladder is secured at the bottom by an individual.
- B: Incorrect - Fall protection is to be attached to engineered anchorage points. Line or snubber supports are NOT approved anchorage points.
- C: Incorrect - Step ladders are NOT allowed to be secured to structural components when used.
- D: Correct - Full body harness properly used and attached to approved anchorage points is required to safely perform work.

Exam Question Number: 66

Reference: SAF-NGGC-2172, Sect. 9.17.

KA Statement: Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

67. G2.1.28 001/CONDUCT OF OPERATION/3/4.1/4.1/RO/HIGH/N/A/RNP AUDIT - 2001/PZR-006
Given the following:

- The plant is operating at 100% RTP.
- A failure of PT-444 input to PC-444J, PZR PRESSURE controller has resulted in an actual Pressurizer pressure increase to 2273 PSIG.
- PC-444J has been placed in MANUAL.

Which ONE (1) of the following describes the action required to return pressure to 2235 PSIG?

- A. Decrease the controller output.
- B. Increase the controller output.
- C. Decrease the pressure setpoint potentiometer.
- D. Increase the pressure setpoint potentiometer.

The correct answer is B.

A: Incorrect - Decreasing the controller output would cause PC-444J to increase pressure.

B: Correct - Required to lower pressure, same as pressure deviation for spray valve operation, except it must be done manually. In auto, the input would have to be 25 - 50 PSIG above the setpoint to induce spray. In manual, the input is manually lowered to energize heaters, or raised to de-energize heaters or open spray valves.

C: Incorrect - With PC-444J in MANUAL, adjustment of the POT would NOT have any effect on PC-444J operation.

D: Incorrect - With PC-444J in MANUAL, adjustment of the POT would NOT have any effect on PC-444J operation.

Exam Question Number: 67

Reference: SD-059, PZR, Pages 17 and 18.

KA Statement: Knowledge of the purpose and function of major system components and controls.

History: Direct from Bank.

FINAL

HLC-08 NRC Written Exam

68. G2.2.6 001/EQUIPMENT CONTROL/3/3.0/3.6/RO/LOW/N/A/NEW - 2008/PRO-NGGC-0204
Given the following:

- The crew has discovered an error in an AOP. The AOP identified the proper title of a pressure indicator, but describes the indicator as PI-2098 instead of the correct number PI-2089.
- A temporary procedure change has been initiated to correct the error.

Which ONE (1) of the following statements applies to the temporary procedure change process IAW PRO-NGGC-0204, PROCEDURE REVIEW AND APPROVAL?

- A✓ The temporary change expires after 21 days unless made permanent by the procedure owner (Operations Manager).
- B. The change must be processed as an INTENT change.
- C. The procedure owner (Operations Manager) must approve the temporary change prior to use in the field.
- D. The expiration date of the temporary change is set at 4 months from the approval date.

The correct answer is A.

- A: Correct - RNP requirement is that a temporary change must be approved or disapproved by the procedure owner within 21 days.
- B: Incorrect - A change of intent can NOT be processed as a temporary change. Whether the change is to an AOP has NO bearing on whether the change can be processed as a temporary change.
- C: Incorrect - A temporary change has to be approved by Management personnel, but it does NOT require the Procedure Owner to approve it before use by the shift operators.
- D: Incorrect - Four months is the expiration date for ALL other Progress Energy sites.

Exam Question Number: 68

Reference: PRO-NGGC-0204, Page 32.

KA Statement: Knowledge of the process for making changes to procedures.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

69. G2.2.40 001/EQUIPMENT CONTROL/3/3.4/4.7/RO/LOW/N/A/NEW - 2008/EDG-009

With the plant operating at 100% RTP, which ONE (1) of the following equipment failures requires the EARLIEST ACTION per Technical Specifications?

Failure of ...

- A. EDG "A".
- B. Battery Charger "A".
- C RC-551C, PZR SAFETY VALVE.
- D. PCV-456, PZR PORV.

The correct answer is C.

- A: Incorrect - Action required within 1 hour to verify breaker alignment for off-site power circuit per LCO 3.8.1, Condition B.
- B: Incorrect - Battery charger failure must be corrected within 2 hours IAW LCO 3.8.4, Condition A.
- C: Correct - Action required LCO 3.4.10, Condition A, Restore valve to OPERABLE status within 15 minutes.
- D: Incorrect - Action required for LCO 3.4.11, Condition A, Close and maintain power to associated block valve within 1 hour.

Exam Question Number: 69

Reference: ITS 3.8.1, 3.8.4, 3.4.10 and 3.4.11.

KA Statement: Ability to apply Technical Specifications for a system.

History: New - Written for HLC-08 NRC Exam

FINAL

HLC-08 NRC Written Exam

70. G2.3.4 001/RADIATION CONTROL/3/3.2/3.7/RO/LOW/N/A/NEW - 2008/10CFR20
Given the following:

- A 25 year old female started working at Robinson as a permanent employee on July 2nd of this year and has an NRC Form 4 on file.
- She previously worked at Salem and had received 200 mRem exposure for this year.
- She has NOT declared pregnancy.
- She has received NO management exposure extensions and NO emergency exists.

Which ONE (1) of the following is the additional exposure she can receive without management concurrence at Robinson this year?

- A. 300 mRem.
- B. 1800 mRem.
- C. 2000 mRem.
- D. 3800 mRem.

The correct answer is C.

- A: Incorrect - This is the additional exposure that would equal the exposure limit (500 mRem) for a fetus for the full term of a pregnancy if declared.
- B: Incorrect - This is the additional exposure that would total 2000 mRem for the year, but the administrative limit is 2000 mRem received at ONLY the Robinson site for the year. As long as the individual does NOT exceed 4000 mRem total exposure, she can receive up to 2000 mRem at Robinson alone.
- C: Correct - The individual may receive an administrative limit of 2000 mRem at Robinson as long as the total combined yearly exposure is less than 4000 mRem.
- D: Incorrect - This additional exposure would total 4000 mRem for the year, but would ONLY be allowed with a dose extension.

Exam Question Number: 70

Reference: DOS-NGGC-0004, ADMINISTRATIVE DOSE LIMITS.

KA Statement: Knowledge of radiation exposure limits under normal or emergency conditions.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

71. G2.3.13 001/RADIATION CONTROL/3/3.4/3.8/RO/LOW/N/A/NEW - 2008/AOP-013-004
Given the following:

- You are in the Spent Fuel Pit performing fuel handling operations.
- A fuel handling accident occurs, and an evacuation is ordered via a PA announcement.

Which ONE (1) of the following is the area designated as the assembly point for this event IAW AOP-013, FUEL HANDLING ACCIDENT?

- A. Immediately outside the Spent Fuel Pit Building door.
- B✓ Landing halfway down the stairs outside the Spent Fuel Pit Building.
- C. Immediately outside the New Fuel Handling Building door.
- D. At the bottom of the stairs outside the Spent Fuel Pit Building.

The correct answer is B.

SFP personnel are expected to evacuate the SFP area, and transit to the landing halfway down to ensure shielding is provided and to limit the spread of contamination.

A: Incorrect - This assembly point is a reasonable choice for an accident occurring in the SFP to ensure personnel are away from the source of radiation. Evacuating to outside of the SFP Building and halfway down the stairs provides distance for shielding.

B: Correct - AOP-013 specifies SFP personnel to stop at the landing halfway down the stairs (shielded, but prevents spread of contamination until cleared.)

C: Incorrect - This is the assembly point for an accident in the New Fuel Handling Building.

D: Incorrect - The procedure specifies to evacuate the SFP Building and proceed to halfway down the stairs to provide distance for shielding but to ensure that there is NOT an unnecessary spread of contamination by the workers.

Exam Question Number: 71

Reference: AOP-013, Page 4.

KA Statement: Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

72. G2.3.7 001/RADIATION CONTROL/3/3.5/3.6/RO/LOW/N/A/NEW - 2008/
Given the following:

- While entering the plant to relieve the shift, you notice smoke coming from the Auxiliary Building.
- You have NOT logged onto any RWP or obtained proper dosimetry (EAD).
- Your assistance is required in the Auxiliary Building.

Which ONE (1) of the following is allowed/required IAW FP-001, FIRE EMERGENCY for the stated conditions?

- A. An exception to the requirement for obtaining an EAD AND RWP login is allowed for qualified members of the Fire Brigade.
- B. An EAD must be obtained AND RWP login must be completed prior to Auxiliary Building entry.
- C. An exception to the requirement for obtaining an EAD AND RWP login is allowed ONLY IF an RC Tech is present to monitor personnel entry/exit to the Auxiliary Building.
- D. RWP login is NOT required, and emergency dosimetry (EAD) is obtained from the Work Control Center.

The correct answer is B.

- A: Incorrect - Exception for dosimetry and RWP login is NOT allowed. Operations personnel are required to obtain proper dosimetry prior to relieving their watchstations.
- B: Correct - RWP login and proper dosimetry is required prior to entry into any RCA.
- C: Incorrect - RC Tech being present does NOT relieve personnel of the requirement for proper dosimetry.
- D: Incorrect - Emergency dosimetry is NOT available in the Work Control Center.

Exam Question Number: 72

Reference: OMM-001-12, Page 8; FP-001, Pages 7-9.

KA Statement: Ability to comply with radiation work permit requirements during normal or abnormal conditions.

History: New - Written for HLC-08 NRC Exam.

FINAL

HLC-08 NRC Written Exam

73. G2.4.16 001/EMERG PROC/PLAN/3/3.8/4.5/SRO/LOW/43.5/RNP AUDIT - 2007/OMM-022-009
Given the following:

- A loss of Component Cooling Water has occurred.
- The crew has implemented AOP-014, COMPONENT COOLING WATER SYSTEM MALFUNCTION.
- A Reactor Trip has occurred.

Which ONE (1) of the following describes the continued use of AOP-014 after the Reactor Trip?

- A. Use of AOP-014 is NOT allowed during EOP performance. Continue use of AOP-014 upon exiting the EOP network.
- B. Use of AOP-014 may ONLY be used concurrently with actions of PATH-1. Use must be suspended upon transition to any other EOP.
- C. Use of AOP-014 may ONLY be used concurrently with EOPs if NO RED or ORANGE path FRPs are being performed.
- D. Use of AOP-014 may be used concurrently as necessary under ALL conditions of EOP use, as long as use of the AOP does NOT delay the mitigation of the event.

The correct answer is C.

A: Incorrect - AOP-014 is a concurrent use procedure.

B: Incorrect - AOP-014 may also be used with other EPPs.

C: Correct - AOP-014 is a concurrent use procedure and will be performed by a licensed operator when directed by the CRSS, concurrent with PATH-1 actions, provided that NO RED or ORANGE path FRPs are being implemented.

D: Incorrect - ALL other procedure usage stops during performance of RED or ORANGE path FRPs.

Exam Question Number: 73

Reference: OMM-022, Page 38.

KA Statement: Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.

History: Bank question used for 2007 RNP Audit.

SRO - Assessment of plant conditions and determination of procedures required for mitigating those events.

FINAL

HLC-08 NRC Written Exam

74. G2.4.22 001/EMERG PROC/PLAN/3/3.5/RO/LOW/N/A/NEW - 2008/OMM-022-003
Given the following:

- The crew is responding to a RED PATH IAW FRP-P.1.
- The STA has just reported a RED PATH on the Heat Sink CSFST AND an ORANGE PATH on Core Cooling CSFST. (Assume ALL conditions have been validated)

FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.

FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION.

FRP-C.2, RESPONSE TO DEGRADED CORE COOLING

Which ONE (1) of the following is the crew's response?

- A✓ Immediately transition to FRP-H.1.
- B. Immediately transition to FRP-C.2.
- C. Continue with FRP-P.1 until complete, then transition to the highest priority CSF.
- D. Continue with FRP-P.1, while concurrently implementing the highest priority CSF.

The correct answer is A.

- A: Correct - Heat Sink RED PATH has a higher priority and IAW OMM-022, any lower priority procedures are exited and the higher priority procedure is entered.
- B: Incorrect - Core Cooling is a higher priority CSF, however, since it is an ORANGE PATH, the higher priority RED PATH is addressed (entered) first.
- C: Incorrect - OMM-022 specifically states that when an FRP is entered it will NOT be exited until completion, except when a higher priority CSF is received.
- D: Incorrect - Only one FRP is to be implemented at a time, highest priority takes precedence.

Exam Question Number: 74

Reference: OMM-022, Pages 18, 19.

KA Statement: Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

75. G2.4.23 001/EMERG PROC/PLAN/3/3.6/4.4/RO/LOW/N/A/NEW - 2008/PATH-1-007

Which ONE (1) of the following is the basis for checking for a Faulted S/G prior to checking Containment conditions for other possible major accidents during performance of PATH-1?

- A✓ Indications could potentially mask other failures.
- B. Early isolation of AFW is required to prevent challenging the RCS Integrity CSFST.
- C. Because of the potential for personnel injury during Steam Break accidents outside of Containment.
- D. Because of the increased potential for Containment failure if all S/Gs are faulted.

The correct answer is A.

A: Correct - A Main Steam break causes a rapid RCS cooldown and SI until the S/G blows dry. RCS temperature will stabilize and the RCS will repressurize to restore normal RCS conditions. This allows other accidents to be diagnosed or the EOP network exited if conditions allow.

B: Incorrect - Early isolation of AFW will limit RCS cooldown and CV pressure, but it will NOT prevent challenging the RCS Integrity CSF.

C: Incorrect - Potential for personnel injury is limited to the area adjacent to CV wall. Any steam break downstream of the MSIVs will be terminated by automatic closure of the MSIVs.

D: Incorrect - EPP-16 is the procedure that will combat ALL 3 faulted S/Gs and bounds the failure within CV analysis.

Exam Question Number: 75

Reference: PATH-1 BD, Page 3.

KA Statement: Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.

History: New - Written for HLC-08 NRC exam.

FINAL

HLC-08 NRC Written Exam

76. 000008 G2.4.11 001/PZR VAPOR SPACE ACCI/1/1/4.0/4.2/SRO/HIGH/43.5/NEW - 2008/AOP-019-002
Given the following:

- The plant is performing a controlled shutdown from 100% RTP.
- A PZR Safety valve has momentarily lifted and continues to leak by.
- APP-003-F6, PZR SAFETY VLV LINE HI TEMP, has illuminated and the crew has performed the applicable actions.
- The crew has stopped the controlled shutdown at 95% power and has entered AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE.

Which ONE (1) of the following describes the strategy, in the proper order, the crew will use to address the event before tripping the Reactor and entering PATH-1? (Assume the actions performed do NOT stop the level decrease)

- A. (1) Maximize charging on ALL three Charging Pumps.
(2) Isolate Letdown.
- B. (1) Maximize charging on two Charging Pumps.
(2) Isolate Letdown.
(3) Start and maximize Charging on the remaining Charging Pump.
- C. (1) Isolate Letdown.
(2) Maximize charging on ALL three Charging Pumps.
- D. (1) Isolate Letdown.
(2) Maximize charging on two Charging Pumps.
(3) Start and maximize Charging on the remaining Charging Pump.

The correct answer is B.

The specific steps, in order, are to maximize charging rate on the first two pumps, isolate letdown, then start and maximize charging on the remaining Charging Pump. If level continues to decrease, trip the Reactor and enter PATH-1. The order is explicit and based on the possibility of three pumps running could challenge the 2500 PSIG Charging Header Relief valves. The third pump will be used ONLY if two pumps and Letdown isolation are NOT sufficient to control level decrease.

- A: Incorrect - Procedure order is to maximize charging on TWO pumps, isolate Letdown, then start and maximize charging with the third pump if level continues to decrease.
- B: Correct - This sequence is specifically directed by AOP-016.
- C: Incorrect - Letdown is isolated AFTER the first two pumps are running at maximum flow. Then the third pump is started and flow maximized.
- D: Incorrect - Letdown is isolated AFTER the first two pumps are running at maximum flow. Then the third pump is started and flow maximized.

HLC-08 NRC Written Exam

Exam Question Number: 76

Reference: APP-003-F6; AOP-016, Pages 3, 6-7; AOP-016 BD, Page 5.

KA Statement: Knowledge of abnormal condition procedures.

History: New - Written for HLC-08 NRC exam.

SRO - The procedural steps for this event are beyond the entry conditions and relate to the specific strategy for mitigating the event.

FINAL

HLC-08 NRC Written Exam

77. 000022 AA2.03 001/LOSS OF RX COOL MAKE/1/1/3.1/3.6/SRO/HIGH/43.5/NEW - 2008/AOP-003-002
Given the following:

- The plant is operating at 100% RTP.
- VCT makeup is in progress.
- The following indications are noted:
 - BA Transfer Pump "A" is running.
 - PW Pump "A" is running.
 - FCV-113A, BA FLOW, OPEN.
 - FCV-113B, BLENDED MU TO CHG SUCT, CLOSED.
 - FCV-114A, PRIMARY WTR FLOW DILUTE MODE, OPEN.
 - FCV-114B, BLENDED MU TO VCT, CLOSED.

- 45 seconds later:
 - APP-003-D5, BA FLOW DEV alarm has illuminated.
 - APP-003-E5, MAKEUP WATER DEV alarm has illuminated.

- BOTH VCT level channels have decreased to 15 inches and continue to decrease.

Which ONE (1) of the following has caused the alarms and what actions are required to mitigate the event?

- A. The Charging Pump suction has swapped to the RWST. Isolate Letdown and minimize Charging flow.
- B. The air supply line to FCV-113B has failed, causing the valve to fail CLOSED. Attempt to establish Makeup to the VCT via FCV-114B.
- C. The Charging Pump suction has swapped to the RWST. Reduce Turbine load as necessary to maintain T_{AVG} within ± 1.5 °F of T_{REF} .
- D. The air supply line to FCV-113B has failed, causing the valve to fail CLOSED. Attempt to establish Makeup via CVC-356, BORIC ACID BLENDER BYPASS TO CHARGING PUMP SUCTION.

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The correct answer is B.

- A: Incorrect - Swapover setpoint is 12.4 inches. NO swapover should have occurred. Action is appropriate for swapover to the RWST on a VCT low level to minimize the boration rate.
- B: Correct - FCV-113B is the ONLY valve listed that is out of position. Since FCV-113B is NOT operating as expected, actions IAW AOP-003 would be correct and an attempt to restore makeup is performed.
- C: Incorrect - Swapover setpoint is 12.4 inches. NO swapover should have occurred. Action is appropriate for boration added to the RCS from the RWST.
- D: Incorrect - Since FCV-113B is NOT operating as expected, AOP-003 has actions to use CVC-356 to makeup to the VCT. CVC-356 is ONLY to be used if FCV-113B AND FCV-114B are unavailable as flowpaths.

Exam Question Number: 77

Reference: APP-003-D5 and E5; AOP-003, Pages 3 and 10, AOP-017, Pages 3 and 34.

KA Statement: Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: Failures of flow control valve or controller.

History: New - Written for HLC-08 NRC Exam.

SRO - Requires analysis of plant conditions and selection of mitigating procedure.
FINAL

HLC-08 NRC Written Exam

78. 000025 AA2.07 001/LOSS OF RHR/1/1/3.4/3.7/SRO/HIGH/43.5/RNP BANK/AOP-020-002
During Mid-Loop operations, the following indications and conditions are noted:

- RHR Pump "A" is operating, FCV-605, RHR HEAT EXCHANGER BYPASS is in AUTO.
- FI-605 indicates 3600 GPM and is oscillating \pm 100 GPM.
- RHR Pump discharge pressure is oscillating \pm 30 PSIG.
- RCS standpipes indicate -73 inches (RTGB) and -74 inches (LOCAL).

Which ONE (1) of the following is the NEXT action required IAW AOP-020, LOSS OF RESIDUAL HEAT REMOVAL?

- A. Reduce total RHR flow by throttling FCV-605 to 2850 GPM.
- B✓ Stop RHR Pump "A" to prevent pump damage.
- C. Establish Charging flow to restore RCS level \geq -68 inches.
- D. Isolate Letdown flow by adjusting HIC-142, PURIFICATION FLOW CONTROLLER to 0%.

The correct answer is B.

- A: Incorrect - IF RHR flow is high, actions to throttle FCV-605 would be appropriate for runout and IAW GP-008. Flow is NOT excessive or indicative of runout conditions
- B: Correct - Standpipe levels below -72 inches are procedurally precluded to prevent vortexing and cavitation (which the oscillations indicate). AOP-020, LOSS OF RESIDUAL HEAT REMOVAL (SHUTDOWN COOLING) directs the RHR Pump to be tripped if cavitation is indicated PRIOR to attempts to restore inventory or eliminate inventory loss.
- C: Incorrect - AOP-020 Section A provides directions for restoring RCS level via Charging Pumps, but ONLY after RHR Pump(s) are stopped earlier in the procedure.
- D: Incorrect - Isolating letdown flow by closing HIC-142 will prevent potential losses from the RHR system. With RCS level $<$ -72 inches, the first action is to stop the running RHR Pump to protect the pump from cavitation.

Exam Question Number: 78

Reference: AOP-020, Pages 3-4, 17-18.

KA Statement: Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Pump Cavitation.

History: Bank question.

SRO - Analysis of conditions and indications to conclude that cavitation is the cause of the abnormal indications, and procedure entry directions for mitigating in the appropriate order (stop the pump to prevent damage)

FINAL

HLC-08 NRC Written Exam

79. 000026 G2.2.38 001/LOSS OF CCW/1/1/3.6/4.5/SRO/HIGH/43.1/NEW - 2008/CCW-012

Given the following:

- The plant is in MODE 3.
- The plant experiences a loss of 480V Bus E-1 and EDG "A" does NOT start.
- CCW Pump "C" breaker has tripped on overload.
- CCW Pump "A" is running.

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

- A. Enter LCO 3.7.6, COMPONENT COOLING WATER SYSTEM; Place the plant in MODE 5 within 36 hours.
- B. Enter LCO 3.0.3; Place the plant in MODE 4 within 7 hours.
- C. Enter LCO 3.7.6, COMPONENT COOLING WATER SYSTEM; Restore 1 CCW Train to operable status within 72 hours.
- D✓ Enter LCO 3.0.3; Place the plant in MODE 5 within 37 hours.

The correct answer is D.

- A: Incorrect - LCO 3.7.6 is correct entry for a single train of CCW INOPERABLE. LCO 3.7.6 Condition A is actually to restore an OPERABLE train of CCW within 72 hours.
- B: Incorrect - BOTH trains INOPERABLE therefore LCO 3.0.3 must be entered, but time to get to MODE 4 is actually 13 hours, 37 hours is correct time to get to MODE 5.
- C: Incorrect - LCO 3.7.6 is correct entry and action for a single train of CCW INOPERABLE.
- D: Correct - CCW Pump "A" is powered from the DS Bus, which is NOT a credited Safeguards power source. Both "B" and "C" Pumps are INOPERABLE and LCO 3.7.6 does NOT contain a condition for BOTH trains INOPERABLE, therefore LCO 3.0.3 must be entered and the plant must be in MODE 5 in 37 hours.

Exam Question Number: 79

Reference: ITS 3.7.6; ITS 3.0.3, ITS 3.7.6 BD.

KA Statement: Knowledge of conditions and limitations in the facility license.

History: New - Written for HLC-08 NRC exam.

SRO - Analysis of current plant conditions and application of generic LCO requirements.
FINAL

HLC-08 NRC Written Exam

80. 000055 EA2.01 001/STATION BLACKOUT/1/1/3.4/3.7/SRO/HIGH/43.5/NEW - 2008/AOP-024-007
Given the following:

- The plant is in MODE 5 with RHR Pump "A" in service.
 - A loss of the Startup Transformer has occurred.
 - The Instrument Air Header is depressurized.
 - RCS Temperature is increasing.
 - RHR Pump "A" is NOT running.
 - The crew has implemented:
 - AOP-017, LOSS OF INSTRUMENT AIR
- AND
- AOP-020, LOSS OF RESIDUAL HEAT REMOVAL (SHUTDOWN COOLING)

In addition to restarting RHR Pump "A", which ONE (1) of the following describes the actions required to restore core cooling to normal operation?

- A. Cross-connect IA with SA by OPENING SA-220 AND 221, SA TO IA CROSS CONNECT FILTER ISOLATION Valves to restore IA pressure.
Reposition FCV-605 and HCV-758 from their Failed SHUT positions.
- B. Start Compressor A and/or B to restore IA pressure.
Reposition FCV-605 and HCV-758 from their Failed OPEN positions.
- C. Cross-connect IA with SA by OPENING SA-220 AND 221, SA TO IA CROSS CONNECT FILTER ISOLATION Valves to restore IA pressure.
Reposition FCV-605 and HCV-758 from their Failed OPEN positions.
- D✓ Start Compressor A and/or B to restore IA pressure.
Reposition FCV-605 and HCV-758 from their Failed SHUT positions.

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The correct answer is D.

- A: Incorrect - Both FCV-605 and HCV-758 fail SHUT on loss of IA, but with the Blackout condition given, SA compressor will NOT be running. Air Compressors A and/or B will be available, but must be manually (local) started. Cross-connecting IA with SA is a normal method of restoring the IA header in AOP-017 for events with power available to the SA compressor.
- B: Incorrect - Restart of Air Compressors A/B will be the success path to restore IA pressure, but both FCV-605 and HCV-758 fail SHUT on loss of IA.
- C: Incorrect - With the Blackout condition given, power to SA compressor will NOT be available. Air Compressors A and/or B will be available, but must be locally started. Both FCV-605 and HCV-758 fail SHUT on loss of IA.
- D: Correct - Loss of IA results in FCV-605 and HCV-758 failing SHUT. Following the RHR pump restart (de-energized on Blackout), and restoration of IA pressure, the Flow/temperature valves must be repositioned.

Exam Question Number: 80

Reference: AOP-017, Pages 3 and 36; SD-003, RHR, Figure 3.

KA Statement: Ability to determine or interpret the following as they apply to a Station Blackout:
Existing valve positioning on a loss of instrument air system.

History: New - Written for HLC-08 NRC Exam.

SRO - Assessment of facility conditions, then recalling what strategy or action is required.
FINAL

HLC-08 NRC Written Exam

81. 000058 G2.1.32 001/LOSS OF DC POWER/1/1/3.8/4.0/SRO/LOW/43.5/NEW - 2008/EPP-26-003

Prior to Step 13 of EPP-26, LOSS OF DC BUS "A", a CAUTION describes a safety issue that prohibits closing the 4160V load breakers onto an energized bus.

Which ONE (1) of the following describes the safety issue?

- A. A personnel hazard exists because the Load Breaker must be closed locally, using a test tool and breaker contact explosion is likely.
- B. An equipment hazard exists because electrical fault conditions at the energized equipment could cause non-isolable faults on the ESF busses.
- C. A personnel hazard exists because local, manual 4160V breaker manipulations have NOT been fully analyzed.
- D. An equipment hazard exists because the test tool used for locally closing the breaker prevents remote breaker operation for several seconds while the tool is engaged.

The correct answer is A.

- A: Correct - Caution prior to Step 13 states "Locally closing 4160V Load Breakers on an energized 4160V Bus could result in explosion of the breaker contacts." The 4KV load breakers are NOT designed to be locally closed onto an energized bus. The tool that will be used is a test tool designed to check breaker face alignment. The slow breaker closure using the test tool would result in extreme arcing and contact explosion if the bus is energized.
- B: Incorrect - The local closure should ONLY be performed to close onto a de-energized bus. At this point in the procedure, only de-energized busses and unloaded breakers are involved.
- C: Incorrect - The loss of DC IS considered a non-credible event at Robinson, requiring a passive failure and therefore NOT included in Accident Analysis. However, the procedure to recover (EPP-26) has been fully evaluated, including the personnel hazards involved.
- D: Incorrect - The step does NOT allow closure onto an energized bus (except under extreme emergency conditions). The breaker test tool does NOT prevent the remote operation of the breaker with the tool engaged.

Exam Question Number: 81

Reference: EPP-26, Page 9; EPP-26-BD, Page 3, 6.

KA Statement: Ability to explain and apply system limits and precautions.

History: New - Written for HLC-08 NRC Exam.

SRO - RO level for entry conditions and any immediate actions of procedures. SRO responsible for procedure steps including Cautions, Notes, and their bases. System knowledge alone does not describe the hazards of the local actions in the procedure.

FINAL

HLC-08 NRC Written Exam

82. 000024 AA2.02 001/EMERG BORATION/1/2/3.9/4.4/SRO/HIGH/43.5/NEW - 2008/EPP-4-003

Given the following:

- An ATWS condition has occurred from 100% RTP.
- The crew is implementing FRP-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS.
- While attempting to borate, MOV-350, BA TO CHARGING PMP SUCT, has failed to reposition from the RTGB.

Which ONE (1) of the following is required IAW FRP-S.1 to begin boration?

- A. ✓ OPEN LCV-115B, EMER MU TO CHG SUCT AND CLOSE LCV-115C, VCT OUTLET.
- B. OPEN FCV-113A, BA FLOW and FCV-113B, BLENDED MU TO CHG SUCT.
- C. Dispatch an operator to Manually OPEN MOV-350, BA TO CHARGING PMP SUCT.
- D. OPEN FCV-113A, BA FLOW and FCV-114B, BLENDED MU TO VCT.

The correct answer is A.

- A: Correct - Step 4 of FRP-S.1 provides this as a full-flow boration path via the RWST as the alternative to the MOV-350 from BA pumps path. This also provides a direct path to borate the RCS.
- B: Incorrect - This would be a restricted (Approx 10 GPM) flow path, it is one of the alternate paths listed in EPP-4, but is NOT in FRP-S.1.
- C: Incorrect - Verify from **RTGB** is the directed step. FRP-S.1 does NOT direct local operation of MOV-350. The phrase "from the RTGB" was specifically added to ensure that the step was NOT interpreted as "If MOV-350 does NOT open, VERIFY implies local manual manipulation to open it", when a faster method was available by way of LCV-115B.
- D: Incorrect - Delayed injection to the core (top of VCT) and restricted flow.

HLC-08 NRC Written Exam

Exam Question Number: 82

Reference: FRP-S.1, Page 7; FRP-S.1 BD, Page 49; SD-021, CVCS, Figure 2; OMM-041, Page 72.

KA Statement: Ability to determine and interpret the following as they apply to the Emergency Boration: When use of manual boration valve is needed.

History: New - Written for HLC-08 NRC exam.

SRO - Requires procedure knowledge and strategy beyond entry conditions and Steps 1 and 2, Immediate Actions.

FINAL

HLC-08 NRC Written Exam

83. 000033 AA2.10 001/LOSS ON IR NI/1/2/3.1/3.8/SRO/LOW/43.5/FARLEY- 2001/NIS-011
Given the following:

- Plant startup is in progress IAW GP-005, POWER OPERATION.
- Reactor is at 8% RTP.
- Reactor Engineering has notified the SSO that BOTH Intermediate Range High Flux Trip setpoints were determined to be set non-conservative.
- The SSO has declared BOTH IR Channels INOPERABLE.

Which ONE (1) of the following describes the action(s) that must be taken in order to comply with Technical Specification requirements?

- A✓ Immediately suspend operations involving positive reactivity additions AND reduce thermal power to < P-6 within 2 hours.
- B. Increase thermal power to > P-10 within 2 hours.
- C. Immediately OPEN the Reactor Trip Breakers.
- D. Restore BOTH channels to OPERABLE status prior to increasing thermal power to > P-10.

The correct answer is A.

- A: Correct - LCO 3.3.1, Condition G actions required if TWO IR channels INOPERABLE with power > P-6, but < P-10.
- B: Incorrect - LCO 3.3.1, Condition F actions if ONE IR channel is INOPERABLE with power > P-6, but < P-10. With TWO IR channels INOPERABLE, Condition G is applicable.
- C: Incorrect - Action required if BOTH Source Range instruments are INOPERABLE per ITS LCO 3.3.1 Condition J.
- D: Incorrect - LCO 3.3.1, Condition H allows continued operation with ONE or BOTH IR channels INOPERABLE when below P-6, but requires restoration prior to going above P-6. Distractor D is a misapplication of Condition H.

HLC-08 NRC Written Exam

Exam Question Number: 83

Reference: ITS 3.3.1, Page 3.3-1, 3.3-3 and 3.3-4.

KA Statement: Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation: Tech-Spec limits if both intermediate range channels have failed.

History: Modified by changing distractors B and D, Removed Subsequent actions and reference to procedures.

SRO - Application of required actions AND application of ITS Conditions for Table 3.3.1-1 for Conditions in excess of LCO.

FINAL

HLC-08 NRC Written Exam

84. 000059 G2.2.14 001/ACC RADWASTE RELEASE/1/2/3.9/4.3/SRO/HIGH/43.3/NEW - 2008/
Given the following:

- The plant is operating in MODE 3.
- A release is in progress from Monitor Tank "A".
- CW Pump "A" is running.
- U1 has ONE CW Pump running.
- The release permit states a release rate of 80 GPM with ONE U2 CW Pump running.

Subsequently:

- CW Pump "A" trips.

Based on current plant conditions, what is the impact on the release?

- A✓ 10CFR20 limits may be exceeded. The release must be stopped.
- B. 10CFR20 limits will NOT be exceeded. NPDES Discharge limits for pH may be exceeded. Terminate the release.
- C. 10CFR20 limits will NOT be exceeded. The release may continue.
- D. 10CFR20 limits may be exceeded. Release may continue provided 2 independent samples were obtained during permit generation.

The correct answer is A.

- A: Correct - Release rate is based on dilution flow from Unit 2 Circ Water Pump with dilution flow of 160,000 GPM. Although Unit 1 has a Circ Water Pump operating, it has a lower capacity (50,000 GPM) than the Unit 2 pump. With the dilution flow being less than the dilution flow that the release was based on, there is a potential that the 10CFR20 release limits will be exceeded.
- B: Incorrect - Dilution flow of Unit 1 Circ Water Pump is lower than that provided by Unit 2 pump. 10CFR20 release limits are impacted based on the assumptions made to authorize the release.
- C: Incorrect - 10CFR20 limits have the potential to be exceeded and the release must be terminated until further analysis has determined that the proper dilution flow is available to support the release.
- D: Incorrect - 2 independent samples for the release generation does NOT have any bearing on the release continuing. The release must be terminated until additional analysis has been performed and proper dilution flow is verified.

HLC-08 NRC Written Exam

Exam Question Number: 84

Reference: EMP-023, Pages 46, 48 and 49.

KA Statement: Knowledge of the process for controlling equipment configuration or status.

History: New - Written for HLC-08 NRC Exam.

SRO - Requires analysis of plant conditions and selection of mitigating procedure. Mitigating actions are beyond entry level knowledge required of ROs.

FINAL

HLC-08 NRC Written Exam

85. 000074 G2.4.21 001/INAD CORE COOLING/1/2/4.0/4.6/SRO/HIGH/43.2/43.3/NEW - 2008/RCS-013
Given the following:

- A LOCA has occurred.
- RCS Subcooling is 0 °F.
- RCPs are secured.
- RCS temperature by CETC is 750 °F.
- RVLIS Full Range is 40%.

The mitigative strategy required for this event is to depressurize the S/Gs to (1) AND verify at least 2 of 3 RCS Hot Legs are less than (2) prior to isolating the SI Accumulators.

A✓ (1) 140 PSIG
(2) 365 °F

B. (1) 140 PSIG
(2) 350 °F

C. (1) atmospheric pressure
(2) 365 °F

D. (1) atmospheric pressure
(2) 350 °F

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The correct answer is A.

The strategy of FRP-C.1 is to depressurize the S/Gs to 140 PSIG to allow the SI Accumulators to discharge into the RCS. Once the SI Accumulators have discharged, they are isolated to prevent the additional nitrogen from being discharged into the RCS. Once the SI Accumulators have been isolated, the S/Gs are depressurized to atmospheric pressure to allow low head SI injection to be provided to the core.

- A: Correct - Conditions have been met to isolate the SI Accumulators. If the RCS temperature has NOT decreased to 365°F, the procedure will place you in a procedure loop to ensure that secondary heat sink is available to allow the S/Gs to continue to be used for cooling.
- B: Incorrect - 140 PSIG is correct but the RCS temperature is 365°F. 350°F is the MODE 4 transition temperature.
- C: Incorrect - S/Gs are depressurized to atmospheric pressure after the SI Accumulators have been isolated. 365°F is the required RCS Hot Legs temperature for SI Accumulator isolation.
- D: Incorrect - S/Gs are depressurized to atmospheric pressure after the SI Accumulators have been isolated. 350°F is NOT the required RCS Hot Legs temperature for SI Accumulator isolation.

Exam Question Number: 85

Reference: FRP-C.1, Pages 10, 12; FRP-C.1 BD, Pages 14, 16, 17.

KA Statement: 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.

History: New - Written for HLC-08 NRC exam.

SRO - Requires knowledge of Procedure (FRP-C.1) beyond entry condition. The strategy involved (maximum cooldown rate using intact S/Gs) and details of target temperatures for step actions such as SI Accumulator Isolation are specific procedure details.

FINAL

HLC-08 NRC Written Exam

86. 003 A2.03 001/REAC COOL PUMP/2/1/2.7/3.1/SRO/HIGH/43.5/NEW - 2008/RCS-008

Given the following;

- The plant is operating at 100% RTP.
- CCW temperature has increased to 102 °F due to CCW Heat Exchanger "A" being out of service for scheduled maintenance.
- RCP "C" thrust bearing temperature has reached 220 °F and stabilized.
- APP-001-B5, RCP HIGH VIB and APP-001-F3, RCP C BEARING HI TEMP are illuminated.
- RCP "C" vibration analysis shows that FRAME vibrations have increased from 2.0 to 3.0 mils in the last 8 hours.

What actions are required IAW AOP-018, REACTOR COOLANT PUMP ABNORMAL CONDITIONS?

Trip the Reactor and trip RCP "C" because the ...

- A. Thrust bearing has exceeded the bearing temperature limit, close CVC-303C, SEAL RETURN ISOLATION Valve, within 3-5 minutes.
- B. Thrust bearing has exceeded the bearing temperature limit, close PCV-455B, PZR SPRAY Valve.
- C. Pump bearing has exceeded the bearing temperature limit, close PCV-455B, PZR SPRAY Valve.
- D. Pump bearing has exceeded the bearing temperature limit, close CVC-303C, SEAL RETURN ISOLATION Valve, within 3-5 minutes.

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The correct answer is B.

- A: Incorrect - RCP thrust bearing has exceeded its maximum limit of 200°F. Valve CVC-303C is ONLY closed when a seal failure occurs on an RCP, NOT for a bearing failure.
- B: Correct - RCP thrust bearing has exceeded its maximum limit of 200°F. After the RCP has been tripped, the affected PZR Spray valve is closed for the non-operating RCP.
- C: Incorrect - RCP pump bearing temperature limit is 225°F and has NOT been exceeded. Action to close the PZR Spray valve for the non-operating RCP is correct.
- D: Incorrect - RCP pump bearing temperature limit is 225°F and has NOT been exceeded. Valve CVC-303C is ONLY closed when a seal failure occurs on an RCP, NOT for a bearing failure.

Exam Question Number: 86

Reference: APP-001-B5; APP-001-F3; AOP-018, Section B.

KA Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Problems associated with RCP motors, including faulty motors and current, and winding and bearing temperature problems.

History: New - Written for HLC-08 NRC exam.

SRO - Requires evaluation of plant conditions and selection of the applicable actions to mitigate the event.

FINAL

HLC-08 NRC Written Exam

87. 013 G2.1.7 001/ESFAS/2/1/4.4/4.7/SRO/HIGH/43.5/NEW - 2008/ESF-006

Given the following:

- The plant is operating at 100% RTP.
- MST-023, Train "B" SAFEGUARDS testing is in progress.
- I&C reports a condition that would prevent Train "B" ESFAS from actuating.

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

- A. Containment Isolation Phase A and Phase B will actuate if required.
Enter LCO 3.3.2 and place the plant in MODE 3 within 12 hours.
- B. Containment Isolation Phase A and Phase B will actuate if required.
Train "B" Safeguards LCO may be delayed for testing for up to 6 hours provided Train "A" Safeguards is OPERABLE.
- C. Containment Isolation Phase A will actuate. Phase B will NOT actuate.
Enter LCO 3.3.2 and place the plant in MODE 3 within 12 hours.
- D. Containment Isolation Phase A will actuate. Phase B will NOT actuate.
Train "B" Safeguards LCO may be delayed for testing for up to 6 hours provided Train "A" Safeguards is OPERABLE.

The correct answer is A.

- A: Correct - Containment Isolation Phase A and Phase B will be actuated from Train "A" Safeguards. Train "B" Safeguards surveillance was in progress when the failure was discovered. During surveillance testing, the LCO can be delayed for up to 6 hours provided that the other train is operable. When a failure occurs or is discovered, the LCO must immediately be declared and the action statement applied.
- B: Incorrect - The LCO must be declared immediately once a failure has occurred or has been discovered.
- C: Incorrect - BOTH Phase A and Phase B will occur from Train "A"
- D: Incorrect - BOTH Phase A and Phase B will occur from Train "A". LCO must be declared immediately when a failure occurs or is discovered.

HLC-08 NRC Written Exam

Exam Question Number: 87

Reference: OMM-022, Page 35.

KA Statement: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior and instrumentation interpretation.

History: New - Written for HLC-08 NRC exam.

SRO - The SRO must determine plant status, exercise operational judgement, and determine the correct actions during changing plant conditions.

FINAL

HLC-08 NRC Written Exam

88. 061 G2.1.27 001/AFW/2/1/3.9/4.0/SRO/LOW/43.1/NEW - 2008/AFW-002

What is the basis for the Condensate Storage Tank minimum volume required by LCO 3.7.5, CONDENSATE STORAGE TANK?

- A. Ability to remove decay heat for 4 hours in MODE 3 using Condenser Steam Dump valves.
- B✓ Ability to remove decay heat for 2 hours in MODE 3 by steaming through the Main Steam Safety Valves.
- C. Ability to maintain at least 1 S/G at 8% level for 4 hours in MODE 3.
- D. Ability to remove decay heat for 2 hours in MODE 3 using Steam Line PORVs.

The correct answer is B.

For anticipated operational occurrences and accidents that do NOT affect the OPERABILITY of the Steam Generators, the analysis assumption is 2 hours at MODE 3, steaming through the MSSVs.

- A: Incorrect - Condenser steam dumps are a valid path but the basis document assumes flow path is through the Main Steam Safety Valves.
- B: Correct - The analysis assumption is 2 hours at MODE 3, steaming through the MSSVs.
- C: Incorrect - 8% level is a minimum level required to satisfy other Heat Sink requirements but the basis for CST level is NOT tied to S/G level.
- D: Incorrect - Steam Line PORVs are a valid path but the basis document assumes flow path is through the Main Steam Safety Valves

Exam Question Number: 88

Reference: LCO 3.7.5 Basis Document.

KA Statement: Knowledge of system purpose and/or function.

History: New - Written for HLC-08 NRC Exam.

SRO - Understanding bases associated with conditions and limitations of the facility license.
FINAL

HLC-08 NRC Written Exam

89. 010 A2.03 001/PZR PRESSURE CONTROL/2/1/4.1/4.2/SRO/HIGH/43.5/NEW - 2008/FRP-H.1-003
Given the following:

- A Reactor Trip and Safety Injection has occurred.
- The crew has entered FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.
- The crew is attempting to establish RCS bleed and feed.
- PCV-456, PZR PORV, failed to open.

Which ONE (1) of the following identifies whether the bleed path is adequate and the required procedural action IAW FRP-H.1?

- A✓ 1 PORV is NOT an adequate bleed path, OPEN ALL RCS and PZR vent valves.
- B. 1 PORV is NOT an adequate bleed path, depressurize ALL S/Gs to atmospheric pressure.
- C. Adequate bleed path exists, depressurize ONE S/G to atmospheric pressure.
- D. Adequate bleed path exists, verify SI flow is established.

The correct answer is A.

- A: Correct - 1 PORV does NOT provide an adequate bleed path to ensure SI flow will cool the core. FRP-H.1 directs opening ALL RCS and PZR vents to provide sufficient vent path if BOTH PORVs are NOT available.
- B: Incorrect - 1PORV is NOT an adequate vent path, but the action to depressurize ALL S/Gs will NOT mitigate the failure of the PORV to OPEN. Depressurizing ONE S/G is an action following lineup of the bleed path to assist in cooldown and allow low pressure water to be added to the S/G.
- C: Incorrect - Assuming that 1 PORV is an adequate bleed path is incorrect and a candidate could make that choice if they assumed that ALL that was needed was a reduction in RCS pressure. Depressurizing ONE S/G is an action following lineup of the bleed path to assist in cooldown and allow low pressure water to be added to the S/G.
- D: Incorrect - Assuming that 1 PORV is an adequate bleed path is incorrect and a candidate could make that choice if they assumed that ALL that was needed was a reduction in RCS pressure. Verifying that SI flow is adequate is an action after the bleed path is established and it is determined to be adequate.

HLC-08 NRC Written Exam

Exam Question Number: 89

Reference: FRP-H.1, Page 19; FRP-H.1 BD, Page 57.

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

History: New - Written for HLC-08 NRC Exam.

SRO - Requires evaluation of plant conditions, selection of appropriate actions and sequence of actions IAW station procedures.

FINAL

HLC-08 NRC Written Exam

90. 103 G2.4.30 001/CONTAINMENT/2/1/2.7/4.1/SRO/LOW/43.5/NEW - 2008/OMM-007-002
Given the following:

- The plant is operating at 50% RTP.
- Power ascension in progress IAW GP-005, POWER OPERATION, following a refueling outage.
- During paperwork reviews, Maintenance Supervision has discovered that the blind flange on the Refueling Transfer Tube was installed but has NOT been properly torqued.
- The Containment has been declared INOPERABLE and the plant must be placed in MODE 3 within 6 hours.

Based on current plant conditions, notification to the NRC Operations Center will be required...

- A. within 4 hours due to invoking 10 CFR 50.54(x), Deviation or Departure from License Condition.
- B. within 4 hours due to the initiation of a shutdown required by the ITS.
- C. within 8 hours because a Safety System will NOT function as required.
- D. within 8 hours due to the failure, degradation, or discovered vulnerability in a safeguard system.

The correct answer is B.

- A: Incorrect - No 10 CFR 50.54(x) condition exists. The candidate may misunderstand the definition and use of 50.54(x).
- B: Correct - A TS shutdown is required, and IAW AP-030, REPORTING REQUIREMENTS, a notification to the NRC Operations Center is required.
- C: Incorrect - This requirement is for a notification when an actual failure to perform a required safety function has occurred, NOT for a condition where a barrier is degraded.
- D: Incorrect - This notification is for a notification of a safeguard system as it relates to allowance of unauthorized or undetected access to a protected area. No access issues are involved with the stated condition.

HLC-08 NRC Written Exam

Exam Question Number: 90

Reference: AP-030, Pages 11 and 12.

KA Statement: Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

History: New - Written for HLC-08 NRC exam.

SRO - Notification to NRC or other outside agencies is SRO responsibility, per AP-030.
FINAL

HLC-08 NRC Written Exam

91. 002 G2.2.40 001/REACTOR COOLANT/2/2/3.4/4.7/SRO/HIGH/43.2/43.5/NEW - 2008/RCS-015
Given the following:

- The Plant is in MODE 3 at 547 °F following a reactor trip from 100% RTP.
- RCS chemistry sample indicates DOSE EQUIVALENT I-131 is 73 Micro-Curies/gram.

Which ONE (1) of the following is the REQUIRED action IAW ITS and the basis for that requirement?

- A. Be in MODE 4 within 12 hours, to place the plant in a MODE where the I-131 limit is NOT APPLICABLE.
- B. Reduce T_{AVG} to < 500 °F within 6 hours, to ensure RCS saturation pressure is below the S/G Safety Valve lift setpoint.
- C. Be in MODE 4 within 6 hours, to place the plant in a MODE where the I-131 limit is NOT APPLICABLE.
- D. Reduce T_{AVG} to < 500 °F within 12 hours, to place the plant in a MODE where the MSIVs AND PZR PORV Block valves can be closed.

The correct answer is B.

- A: Incorrect - This is the partial LCO applicable to I-131 greater than 0.25, and less than 60 Micro-Curies/gm, except LCO requires MODE 3 with $T_{AVG} < 500$ °F
- B: Correct - ITS for I-131 is applicable in MODE 3 with $T_{AVG} > 500$ °F. Saturation pressure for 500 °F is 665 PSIG which is below the S/G Safety Valve setpoint.
- C: Incorrect - No MODE 4 requirements. Basis is for conditions below S/G Safety Valve setpoint.
- D: Incorrect - S/G Safety Valves, NOT MSIVs, are the bases for the requirement. MSIVs may be CLOSED any time following the trip, but will remain OPEN to allow controlled cooldown/depressurization of S/Gs. PZR PORV Block valves may be CLOSED below MODE 3, but are NOT the bases for the requirement.

HLC-08 NRC Written Exam

Exam Question Number: 91

Reference: ITS 3.4.16; ITS 3.4.16 BD.

KA Statement: Ability to apply Technical Specifications for a system.

History: New - Written for HLC-08 NRC exam.

SRO - Knowledge of ITS beyond 1 hour action statements.

FINAL

HLC-08 NRC Written Exam

92. 011 G2.4.50 001/PZR LVL CONTROL/2/2/4.2/4.0/SRO/HIGH/43.5/NEW - 2008/PZR-008
Given the following:

- The plant is operating at 100% RTP.
- APP-003-E8, PZR CONTROL HI/LO LVL is illuminated.
- APP-003-F4, CHG PMP HI SPEED is illuminated.
- RCS Pressure is 2215 PSIG and decreasing.
- T_{AVG} is equal to T_{REF} .

Which ONE (1) of the following is the correct procedure to implement and the appropriate actions for the event in progress?

- A. AOP-019, MALFUNCTION OF RCS PRESSURE CONTROL.
Place PC-444J, PZR PRESS in MANUAL and control Heaters and Spray to restore pressure.
- B. AOP-019, MALFUNCTION OF RCS PRESSURE CONTROL.
Control Charging and Letdown to stabilize PZR level.
- C. AOP-016, EXCESSIVE PRIMARY LEAKAGE.
Place PC-444J, PZR PRESS in MANUAL and control Heaters and Spray to restore pressure.
- D. AOP-016, EXCESSIVE PRIMARY LEAKAGE.
Control Charging and Letdown to stabilize PZR level.

The correct answer is D.

APP-003-E8 lists possible causes as a Load Rejection (refer to AOP-015), excessive RCS leakage (refer to AOP-016), a PZR level controller failure (AOP-025) and if a PZR level control problem exists then Manually adjust Charging Pump speed and Letdown to maintain PZR level.

- A: Incorrect - AOP-019 basis document states that this procedure is NOT intended to combat an RCS pressure decrease due to a loss of RCS inventory.
- B: Incorrect - AOP-019 basis document states that this procedure is NOT intended to combat an RCS pressure decrease due to a loss of RCS inventory.
- C: Incorrect - AOP-016 is the proper procedure to restore stable conditions in the RCS. With the given conditions, restoring PZR Pressure to its normal band will NOT provide the necessary corrective actions for this situation.
- D: Correct - Controlling charging and letdown flow rates will enable the operators to restore conditions to stabilize the plant.

HLC-08 NRC Written Exam

Exam Question Number: 92

Reference: AOP-019, Pages 5, 6; AOP-016, Pages 6, 7.

KA Statement: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

History: New - Written for HLC-08 NRC exam.

SRO - Assessment of facility conditions and selection of appropriate procedures during abnormal situations.

FINAL

HLC-08 NRC Written Exam

93. 071 G2.2.25 001/WASTE GAS DISPOSAL/2/2/3.2/4.2/SRO/LOW/43.2/NEW - 2008/WD-008

Which ONE (1) of the following describes the TRM limitation on the quantity of radioactivity permitted in the Waste Gas Decay Tank(s) AND the basis for that limit?

The quantity contained in (1) shall be $\leq 1.9 \times 10^4$ Curies (Xe-133 Noble Gas) to ensure an uncontrolled release will (2).

- A. (1) ALL Waste Gas Decay Tanks combined
(2) NOT result in exceeding the annual total body exposure to offsite personnel
- B. (1) EACH Waste Gas Decay Tank
(2) result in onsite exposures that remain within the Accident Analysis
- C. (1) ALL Waste Gas Decay Tanks combined
(2) result in onsite exposures that remain within the Accident Analysis
- D✓ (1) EACH Waste Gas Decay Tank
(2) NOT result in exceeding the annual total body exposure to offsite personnel

The correct answer is D.

From TRM 3.21 Basis "...in the event of an uncontrolled release of the tank's contents, the resulting total body exposure to a member of the public at the nearest site boundary will not exceed 0.5 rem in an event of 2 hours duration."

A: Incorrect - The limit is applied to EACH Waste Gas Decay Tank.

B: Incorrect - Applicability is correct to EACH tank, but basis is incorrect. Plausible if candidate assumes Accident Analysis addresses personnel likely to receive MOST exposure (onsite personnel) on a release, however analysis for TRM basis only addresses exposure at the site boundary.

C: Incorrect - The limit is applied to EACH tank and basis is incorrect. Plausible if candidate assumes Accident Analysis addresses personnel likely to receive MOST exposure (onsite personnel) on a release, however analysis for TRM basis only addresses exposure at the site boundary.

D: Correct - The limit is applied to EACH Waste Gas Decay Tank, and ensures a member of the public will not receive a dose in excess of 0.5 Rem in event of an uncontrolled release of a single tank's contents in an event of 2 hours duration.

HLC-08 NRC Written Exam

Exam Question Number: 93

Reference: TRM 3.21; TRM 3.21 BD.

KA Statement: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

History: New - Written for HLC-08 NRC Exam.

SRO - Knowledge of Tech Spec Bases that is required to analyze TS required actions and terminology.

FINAL

HLC-08 NRC Written Exam

94. G2.1.41 001/CONDUCT OF OPERATION/3/2.8/3.7/SRO/LOW/43.6/NEW - 2008/AOP-020-004
Given the following:

- The plant is in MODE 6 for Refueling.
- Core offload is in progress with a Fuel Assembly on the Manipulator.
- The Transfer Cart is loaded with a Fuel Assembly, enroute to the SFP.
- You are the Refueling SRO.

You observe that Refueling Cavity level is decreasing.

In the current plant conditions, which ONE (1) of the following is the required action IAW AOP-020, LOSS OF RESIDUAL HEAT REMOVAL (SHUTDOWN COOLING)?

Place the Fuel Assembly from the Manipulator in the ...

- A. RCC change fixture.
- B. core, in it's original location.
- C. Upender.
- D. core, in any location that is bordered by 2 other assemblies.

The correct answer is B.

- A: Incorrect - RCC Change fixture does have a basket that is available to receive the fuel assembly, but placing the assembly in the RCC Change fixture while losing Refueling Cavity level could result in the fuel assembly being uncovered and cause excessive radiation exposure.
- B: Correct - Place the fuel assembly back in a location where subcritical configuration was known.
- C: Incorrect - The Transfer Cart is enroute to the SFP and contains the assembly basket and an irradiated fuel assembly. There is NO basket available in which to place the fuel assembly.
- D: Incorrect - Placing a fuel assembly in an unanalyzed core position could result in a loss or reduction of the required shutdown margin.

Exam Question Number: 94

Reference: AOP-020, Section B.

KA Statement: Knowledge of the refueling process.

History: New - Written for HLC-08 NRC Exam.

SRO - Knowledge of Refueling Procedures and processes.

FINAL

HLC-08 NRC Written Exam

95. G2.2.18 001/EQUIPMENT CONTROL/3/2.6/3.9/SRO/HIGH/43.5/RNP AUDIT - 2001/OMM-001-11-002
Given the following:

- RC personnel need to use Demin Water for decon activities for a spent fuel cask.
- They will need to operate one valve for about an hour AND will finish before shift turnover.
- The valve manipulation is NOT covered by an approved procedure.

Which ONE (1) of the following describes how this manipulation will be tracked and controlled IAW OMM-001-11, LOGKEEPING?

- A. A temporary procedure must be approved prior to manipulation of the valve.
- B✓ The valve manipulation must be entered in the Start/Stop Log of Autolog.
- C. A Caution Tag must be issued for the valve being manipulated.
- D. The portion of the system to be realigned must be taken out of service and controlled with Danger Tags.

The correct answer is B.

A: Incorrect - A temporary procedure is NOT appropriate for single valve operation unless water is to be introduced into a system or within a clearance boundary.

B: Correct - The WCC SRO or the CRSS determines which method of control is used. They will then direct an Autolog entry to provide the necessary tracking to ensure proper alignment of the valve IAW OMM-001-11.

C: Incorrect - Use caution tags would be required if the alignment would be in effect past the end of the shift.

D: Incorrect - Portion of system component requires caution tags if out of position past the end of the shift.

Exam Question Number: 95

Reference: OMM-001-11, Pages 23-25.

KA Statement: Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.

History: Bank question.

SRO - Assessing plant conditions and then applying appropriate procedural requirements for maintaining configuration control.

FINAL

HLC-08 NRC Written Exam

96. G2.2.15 001/EQUIPMENT CONTROL/3/3.9/4.3/SRO/LOW/43.3/NEW - 2008/OMM-001-8-002
Given the following:

- Earlier in the shift, a Clearance was established for maintenance activities on the CV Spray system.
- An operator is now restoring the system to normal alignment.
- During system restoration, a valve which was inside the Clearance boundary was found out of alignment.
- It is believed that the valve was mispositioned during maintenance activities.
- There are other valves within the Clearance boundary within close proximity to the mispositioned valve.

What minimum procedural actions are REQUIRED by OMM-001-8, CONTROL OF EQUIPMENT AND SYSTEM STATUS?

- A. The event shall be considered as a Deliberate Misposition Event until the cause is investigated and established.
- B. ONLY the mispositioned valve must be verified in the correct position IAW the system Operating Procedure.
- C. A full system lineup is required IAW the system Operating Procedure.
- D✓ A valve lineup is required for ALL valves within the Clearance boundary IAW the system Operating Procedure.

The correct answer is D.

- A: Incorrect - OMM-001-8, Section 8.5.6 specifies that "if there is reason to believe the valve was deliberately mispositioned or tampered with..." it is treated as a Deliberate Mispositioning. This is NOT the default assumption. Additional information or suspicion may invoke this set of actions, but NO evidence is established in the question stem.
- B: Incorrect - If the cause of the mispositioning can be clearly identified, a single valve lineup is allowed. The question stem does NOT clearly identify the cause. There are other valves within close proximity to the mispositioned valve.
- C: Incorrect - A full valve lineup is to be performed if the cause of the mispositioning is unknown and CANNOT be quickly determined. A full valve lineup is NOT required because the valve is within the Clearance boundary.
- D: Correct - OMM-001-8 specifies that a valve lineup of valves within the Clearance boundary is to be performed if maintenance activities were performed on valves within the Clearance boundary, and it is believed that those maintenance activities caused the mispositioning.

HLC-08 NRC Written Exam

Exam Question Number: 96

Reference: OMM-001-8, Page 17.

KA Statement: Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.

History: New - Written for HLC-08 NRC Exam.

SRO - Requires analysis of plant events and administrative processes and determination of required actions to maintain configuration control.

FINAL

HLC-08 NRC Written Exam

97. G2.2.36 001/EQUIPMENT CONTROL/3/3.1/4.2/SRO/LOW/43.2/SALEM - 2001/ITS INTRO-005
Given the following:

- The plant is operating at 100% RTP.
- SI Pump "A" is INOPERABLE due to failed motor bearings.
- While aligning SI Pump "B" to replace SI Pump "A", the E-1 supply breaker 52-22B breaker racking mechanism was found broken, preventing the breaker from being racked in and closed.
- An audit of surveillance procedures has determined the last quarterly surveillance on SI Pump "C" was missed.

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

- A. Operability Determination is required for SI Pump "C" IAW OPS-NGGC-1305, OPERABILITY DETERMINATIONS.
- B. Perform a Safety Function Determination for SI Pump "C" IAW OMM-007, EQUIPMENT INOPERABLE RECORD.
- C. Demonstrate the operability of SI Pump "C" within 24 hours OR be in MODE 4 within 13 hours.
- D. Demonstrate the operability of SI Pump "C" within 72 hours OR be in MODE 3 within 6 hours.

The correct answer is C.

- A: Incorrect - Inappropriate application of operability determination procedure OPS-NGGC-1305.
- B: Incorrect - Inappropriate application of TS 5.5.15, Safety Function Determination Program.
- C: Correct - Since SI Pumps "A" is INOPERABLE and "B" CANNOT be placed in service, the plant is in a 72 hour LCO. The missed surveillance has placed the plant in a condition where the surveillance must be performed within 24 hours or the plant must be placed in MODE 4 within 13 hours.
- D: Incorrect - Represents inappropriate application of TS 3.5.2, Condition A for a single train of SI inoperable. For 1 or more trains inoperable with 100% flow to a single operable train available.

HLC-08 NRC Written Exam

Exam Question Number: 97

Reference: ITS 3.0.3; SR 3.0.3; ITS 5.5.15; ITS 3.5.2; OMM-007, Pages 25, 26;
OPS-NGGC-1305, Pages 7 and 8.

KA Statement: Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

History: Bank question.

SRO - Requires a 'from memory' application of Tech Specs in a situation where TS 3.0.3 and SR 3.0.3 may apply. The SRO has to determine the appropriate course of action.

FINAL

HLC-08 NRC Written Exam

98. G2.4.6 001/EMERG PROC/PLAN/3/3.7/4.7/SRO/HIGH/43.5/NEW - 2008/EPP-16-003
Given the following:

- The Reactor has tripped from 100% RTP.
- RCS temperature is 430 °F.
- RCS pressure is 635 PSIG.
- S/G "A" pressure is 100 PSIG.
- S/G "B" pressure is 50 PSIG.
- S/G "C" pressure is 50 PSIG.
- CV pressure is 38 PSIG.

Which ONE (1) of the following describes the correct mitigation strategy?

- A. Throttle Feedwater to ALL S/Gs to 80 to 90 GPM IAW Foldout A.
- B. Isolate Feedwater to S/Gs "B" and "C", continue to feed S/G "A" IAW Foldout A.
- C. Isolate Feedwater to S/Gs "B" and "C", continue to feed S/G "A" IAW EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.
- D. Throttle Feedwater to ALL S/Gs to 80 to 90 GPM IAW EPP-16, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.

The correct answer is D.

- A: Incorrect - Correct mitigative strategy, but Foldout A requires 1 intact S/G. Stem conditions indicate that ALL S/Gs are faulted and EPP-16 will be used.
- B: Incorrect - Correct mitigative strategy and correct procedure for 2 faulted S/Gs. Stem conditions indicate that ALL S/Gs are faulted and EPP-16 will be used.
- C: Incorrect - EPP-16 is the correct procedure to enter, however, the mitigative strategy is incorrect, Feedwater would NOT be isolated to ALL S/Gs.
- D: Correct - Stem conditions indicate that ALL S/Gs are faulted and EPP-16 will be used. EPP-16 throttles flow to ALL S/Gs to 80 to 90 GPM. This ensures S/G internals are kept wet.

HLC-08 NRC Written Exam

Exam Question Number: 98

Reference: EPP-16, Pages 3 and 8; EPP-16 BD, Page 18; Foldout A, Pages 3-8.

KA Statement: Knowledge of EOP mitigation strategies.

History: New - Written for HLC-08 NRC exam.

SRO - Detailed knowledge and implementation of the EOP network mitigation strategy past the Immediate Actions.

FINAL

HLC-08 NRC Written Exam

99. G2.4.8 001/EMERG PROC/PLAN/3/3.8/4.5/SRO/HIGH/43.5/NEW - 2008/OMM-022-009
Given the following:

- The plant was operating at 100% RTP
- A major rupture occurs in the CCW Common Discharge Header.
- The crew has implemented AOP-014, COMPONENT COOLING WATER SYSTEM MALFUNCTION.
- The Reactor Operator reports that CCW Surge Tank Level is 5% and lowering.

Which ONE (1) of the following describes, in order, the actions required in response to this event?

- A. 1) Verify the Reactor is tripped
2) Perform the Immediate Actions of PATH-1
3) Trip the RCPs.
4) Lockout the CCW Pumps
- B. 1) Verify the Reactor is tripped
2) Trip the RCPs
3) Perform the Immediate Actions of PATH-1
4) Lockout the CCW Pumps
- C. 1) Lockout the CCW Pumps
2) Verify the Reactor is tripped
3) Perform the Immediate Actions of PATH-1
4) Trip the RCPs
- D. 1) Lockout the CCW Pumps
2) Verify the Reactor is tripped
3) Trip the RCPs
4) Perform the Immediate Actions of PATH-1

HLC-08 NRC Written Exam

The correct answer is B.

From AOP-014: 2. Check Reactor - CRITICAL (YES)

3. Verify Reactor - TRIPPED

4. Stop ALL RCPs

5. Go To PATH-1 While Continuing With This Procedure

A: Incorrect - Actions are all correct however, AOP-014 and OMM-022 specifically address this case that the RCPs will be tripped IAW the AOP before performing Immediate Actions of PATH-1.

B: Correct - Order is correct IAW AOP-014 and OMM-022.

C: Incorrect - Locking out the CCW pumps would be required for these conditions, but AOP-014 does NOT direct protecting the CCW pumps until after the Reactor is tripped. OMM-022 states that other actions should NOT be performed until after Immediate Actions are complete.

D: Incorrect - Incorrect order of actions, but plausible if candidate believes protecting CCW pumps on lowering Surge Tank level is the priority and that Immediate Actions must be performed prior to tripping RCPs.

Exam Question Number: 99

Reference: OMM-022, Page 38.

KA Statement: Knowledge of how abnormal operating procedures are used in conjunction with EOPs.

History: New - Written for HLC-08 NRC exam.

SRO - Assessment of plant conditions and determination of procedural actions required for mitigating those events.

FINAL

HLC-08 NRC Written Exam

100. G2.4.18 001/EMERG PROC/PLAN/3/3.3/4.0/SRO/LOW/43.1/NEW - 2008/FRP-H.1-003

Which ONE (1) of the following is the strategy and basis for Reactor Coolant Pump (RCP) operation in FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK?

- A. Verify ONLY ONE RCP is operating prior to initiating bleed and feed to ensure maximum bleed flow through the PZR PORVs.
- B. Stop ALL RCPs to eliminate the heat input from the RCPs extending the time available to restore feed flow before bleed and feed criteria is met.
- C. Verify ONLY ONE RCP is operating to reduce the heat input from the RCPs extending the time available to restore feed flow before bleed and feed criteria is met.
- D. Stop ALL RCPs to establish Natural Circulation cooling in preparation for bleed and feed.

The correct answer is B.

A: Incorrect - Several FRPs do direct operation of only one pump and an RCP operating will increase bleed flow, but this procedure is for loss of S/G inventory and it is NOT desired during FRP-H.1.

B: Correct - Elimination of the RCPs as a heat source extends the time available before bleed and feed criteria is met by as much as 9 minutes.

C: Incorrect - Elimination of ALL of the RCPs as a heat source extends the time available before bleed and feed criteria is met by as much as 9 minutes.

D: Incorrect - Stopping the RCPs eliminates the heat input to the RCS. Once bleed and feed is established, sufficient SI flow will be provided through the core to meet the heat removal needs.

Exam Question Number: 100

Reference: FRP-H.1 BD, Pages 15, 16 and 48.

KA Statement: Knowledge of the specific bases for EOPs.

History: New - Written for HLC-08 NRC exam.

SRO - Knowledge of strategy or action in emergency procedures beyond immediate actions.

FINAL