

U.S. Nuclear Regulatory Commission
Site-Specific SRO Written Examination**Applicant Information**

Name:

Date: February 10, 2009

Facility/Unit: North Anna Units 1 & 2

Region: I ☐ II ☒ III ☐ IV ☐Reactor Type: W ☒ CE ☐ BW ☐ GE ☐

Start Time:

Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

Applicant's Signature**Results**RO/SRO-Only/Total Examination Values 75 / 25 / 100 Points

Applicant's Scores _____ / _____ / _____ Points

Applicant's Grade _____ / _____ / _____ Percent

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1. Given the following conditions:

- RCS T_{AVE} is 572°F.
- "D" bank rods are at 190 steps.
- Rod control is in AUTOMATIC.

Median/Hi T_{AVE} input to automatic rod control fails LOW.

Which ONE of the following identifies the **Immediate Operator Action** required, and the **effect of the transient** on Shutdown Margin?

- A. Verify redundant instrument channel indication NORMAL;
Shutdown Margin has increased.
- B. Verify redundant instrument channel indication NORMAL;
Shutdown Margin has not changed.
- C. Place Rods in MANUAL;
Shutdown Margin has increased.
- D. Place Rods in MANUAL;
Shutdown Margin has not changed.

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2. Given the following conditions:

- Unit 1 is at 25% power and slowly ramping up following a refueling outage
- The "B" Condensate Pump and "B" Main Feedwater Pump are both tagged out
- Power is lost to the "B" Station Service Bus

As a result of this transient, the OATC should **initially** expect to see level in the "B" SG _____,
and level in the "A" and "C" SGs _____.
(Assume no operator action)

- A. increase ; increase
- B. increase ; decrease
- C. decrease ; increase
- D. decrease ; decrease

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3. With Unit 1 at 100% power, annunciator A-E5, RCP 1A VIBRATION ALERT/DANGER, is received.

The Backboards Operator reports the following:

- "A" RCP Seismic vibration = 7 mils
- "A" RCP Proximity vibration = 12 mils

Which ONE of the following identifies the **status of "A" RCP vibration**, and the **actions required** by AR-A-E5, RCP 1A VIBRATION ALERT/DANGER?

- A. Seismic vibration is above the ALERT level;
Increase frequency of monitoring RCP vibration and consider shutting down "A" RCP if increasing trend continues.
- B. Seismic vibration is above the DANGER level;
Trip the reactor and perform the immediate operator actions of 1-E-0, Reactor Trip or Safety Injection, then stop "A" RCP.
- C. Proximity vibration is above the ALERT level;
Increase frequency of monitoring RCP vibration and consider shutting down "A" RCP if increasing trend continues.
- D. Proximity vibration is above the DANGER level;
Trip the reactor and perform the immediate operator actions of 1-E-0, Reactor Trip or Safety Injection, then stop "A" RCP.

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4. As the RCS is cooled down from Hot Standby to Cold Shutdown, RCP seal **injection** flows will _____, and running RCP motor current will _____.

- A. decrease ; increase
- B. increase ; increase
- C. increase ; remain the same
- D. decrease ; remain the same

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5. Given the following conditions:

- The OATC has established a 65 gpm dilution in accordance with 1-GOP-8.3.1, Placing the Blender in the Dilute Mode of Operation
- The operator has adjusted the flow rate to the desired value, and matched the setpoint on the controller

Shortly thereafter, the demand on controller 1-CH-FC-1114A, Primary Water to Blender Flow Controller, fails to 100%.

Which ONE of the following identifies the response of the Blender?

- A. Annunciator B-D7, PG WATER TO BLENDER FLOW DEV, alarms as soon as the failure occurs; 1-CH-FCV-1114A, PG to Blender Flow Control Valve, automatically closes.
- B. Annunciator B-D7, PG WATER TO BLENDER FLOW DEV, alarms as soon as the failure occurs; 1-CH-FCV-1114B, Blender Makeup to VCT, automatically closes.
- C. Annunciator B-D7, PG WATER TO BLENDER FLOW DEV, alarms approximately 20 seconds after the failure occurs; 1-CH-FCV-1114A, PG to Blender Flow Control Valve, automatically closes.
- D. Annunciator B-D7, PG WATER TO BLENDER FLOW DEV, alarms approximately 20 seconds after the failure occurs; 1-CH-FCV-1114B, Blender Makeup to VCT, automatically closes.

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6. Given the following conditions:

- RHR is in-service with 1-RH-P-1A running and 1-CC-P-1B running
- 1-RH-P-1B and 1-CC-P-1A are available with their respective control switches in AFTER-STOP

The normal supply breaker to 1H 4160-Volt Bus is inadvertently opened.

Which ONE of the following identifies the pump configuration after EDG loading is complete?

- A. ONLY 1-RH-P-1B running and ONLY 1-CC-P-1B running.
- B. ONLY 1-RH-P-1B running and BOTH 1-CC-P-1A & 1-CC-P-1B running.
- C. NO RHR pumps running and ONLY 1-CC-P-1B running.
- D. NO RHR pumps running and BOTH 1-CC-P-1A & 1-CC-P-1B running.

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7. Given the following conditions:

- Rod H-2, Control Bank D group 1 is mis-aligned LOW
- Operators are preparing to realign the rod in accordance with 1-AP-1.3, Control Rod Out of Alignment

1-AP-1.3 will direct the crew to _____; as a result of this action, the crew should expect a _____ alarm when Rod H-2 is withdrawn.

- A. Open the lift coil disconnect switches for Control Bank D, Gp 1 rods ONLY, EXCEPT for Rod H-2; Rod Control Non-Urgent Failure.
- B. Open the lift coil disconnect switches for Control Bank D, Gp 1 rods ONLY, EXCEPT for Rod H-2; Rod Control Urgent Failure.
- C. Open the lift coil disconnect switches for ALL Control Bank D rods, EXCEPT for Rod H-2; Rod Control Non-Urgent Failure.
- D. Open the lift coil disconnect switches for ALL Control Bank D rods, EXCEPT for Rod H-2; Rod Control Urgent Failure.

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8. Unit 1 is in Mode 6.

Technical Specifications require ONE RHR loop operable and in operation whenever water level is _____; compliance with this LCO ensures _____.

- A. greater than or equal to 23 feet above the top of the reactor vessel flange; proper mixing of RCS coolant to minimize the possibility of localized dilution.
- B. greater than or equal to 23 feet above the top of the reactor vessel flange; acceptable limits are maintained in the event of a fuel handling accident.
- C. less than 23 feet above the top of the reactor vessel flange; proper mixing of RCS coolant to minimize the possibility of localized dilution.
- D. less than 23 feet above the top of the reactor vessel flange; acceptable limits are maintained in the event of a fuel handling accident.

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9. Operators are responding to a LOCA and are performing Step 12 of 1-E-1, Loss of Reactor or Secondary Coolant, which directs them to "Check if Low-Head SI Pumps Should be Stopped."

The following plant conditions exist:

- One charging pump is running and no others are available to be started
- RCS pressure is 350 psig and stable
- Containment pressure is 17 psia and slowly decreasing
- RWST level is 58% and slowly decreasing

Based on these plant conditions, which ONE of the following identifies the **action required** by 1-E-1, and the **basis for the action**?

- A. Leave Low-Head SI pumps running since they are providing core cooling.
- B. Leave Low-Head SI pumps running to prepare for the transfer to Cold Leg Recirc.
- C. Stop Low-Head SI pumps to minimize the potential for pump and motor overheating.
- D. Stop Low-Head SI pumps to minimize the potential for contaminating the RWST.

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10. During 100% power operation, PRT in-leakage is identified as increasing.

Which ONE of the following identifies a possible source?

- A. RCP #2 seal leakoff.
- B. RCP seal return relief valve leakage.
- C. RCS loop stop valve stem leakoff.
- D. Reactor vessel head vent valve leakage.

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11. Unit 1 is at 100% power when the following events occur:

- 0830 An instrument malfunction results in a PORV opening. The OATC attempts to close the affected PORV, but it remains full open. The OATC attempts to close the associated PORV block valve, but the PORV block valve breaker trips as soon as the switch is taken to CLOSE. The OATC manually trips the Unit and the crew enters 1-E-0, Reactor trip or Safety Injection.
- 0845 The Shift Manager classifies the event in accordance with EPIP-1.01, Emergency Manager Controlling Procedure.

Based on reporting requirements, the **latest** time that state and local authorities must be notified is _____, and the **latest** time that the NRC must be notified is _____.

- A. 0900 ; 0945
- B. 0900 ; 1000
- C. 0930 ; 0930
- D. 0930 ; 1030

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12. One of the purposes of the CC System is to cool the unit from _____ to 140°F within _____ assuming a Service Water Temperature of 95°F.
- A. 350°F ; 16 hours
 - B. 350°F ; 24 hours
 - C. 547°F ; 16 hours
 - D. 547°F ; 24 hours

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13. Unit 1 was operating at 100% power when a LOCA occurred inside containment.

The following plant conditions exist:

- The crew is currently implementing 1-E-0, Reactor Trip or Safety Injection
- Containment pressure is 21 psia and stable
- Containment pressure peaked at 25 psia
- Core Exit TCs indicate 510°F
- RCS pressure is 1100 psig
- Total high-head safety injection flow to the core is 500 gpm

Based on these plant conditions, the Reactor Coolant Pumps should _____.

- A. not be secured
- B. be secured because RCS pressure is less than 1275 psig
- C. be secured due to low subcooling
- D. be secured due to loss of component cooling flow

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14. Operators are stabilizing the plant following a reactor trip due to a loss of offsite power.

The following plant conditions exist:

- RCS temperature is 551°F and stable.
- PRZR pressure is 2100 psig and stable with one group of heaters energized.
- PRZR liquid temperature is 600°F and stable.
- Charging flow is 40 gpm and constant with 1-CH-FCV-1122 in MANUAL.
- Seal injection flows are 8 gpm each.
- Seal leakoff flows are 3 gpm each.

PRZR level increased to 35%; the crew has just placed 1-CH-HCV-1200B in service and letdown flow indicates 73 gpm.

Which ONE of the following describes the plant response?

- A. PRZR level will remain stable;
PRZR pressure will remain stable
- B. PRZR level will decrease;
PRZR pressure will remain stable
- C. PRZR level will remain stable;
PRZR pressure will decrease
- D. PRZR level will decrease;
PRZR pressure will decrease

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15. The _____ ensures that the allowable heat generation rate (kw/ft) is not exceeded; the setpoint for this trip is _____.
- A. Overpower ΔT trip ; 107.9%
 - B. Overpower ΔT trip ; 126.4%
 - C. Power Range Neutron Flux trip - High S/P ; 109%
 - D. Power Range Neutron Flux trip - High S/P ; 110%

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16. Given the following conditions:

- Unit 1 is at 100% power
- Containment Pressure Protection Channel II (1-LM-P-100B) failed on the previous shift
- All bistables for the failed channel have been placed in TEST in accordance with 1-MOP-55.75, Containment Pressure Protection Instrument

Subsequently, Containment Pressure Protection Channel III (1-LM-P-100C) fails HIGH.

Which ONE of the following identifies the response of the Engineered Safeguards Features Actuation System?

- A. No automatic actuations.
- B. Safety Injection actuation ONLY.
- C. Safety Injection actuation and Main Steam Line Isolation ONLY.
- D. Safety Injection actuation, Main Steam Line Isolation, and CDA.

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17. Given the following conditions:

- A spurious turbine runback occurs and is terminated at 80% power
- Operators are stabilizing the unit, and annunciator A-H7, A.F.D MONITOR, has just alarmed

Which ONE of the following identifies the **MINIMUM** number of NI channels with an AFD that exceeds the allowable limits of the Reactor Data book to consider the alarm valid, and the Technical Specification **required action**?

- A. 1 NI channel;
reduce power to < 50% within 30 minutes.
- B. 1 NI channel;
reduce power to < 75% within 30 minutes.
- C. 2 NI channels;
reduce power to < 50% within 30 minutes.
- D. 2 NI channels;
reduce power to < 75% within 30 minutes.

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18. Which ONE of the following responses is **NOT** an indication that the #2 seal has failed on a Reactor Coolant Pump?

- A. Increasing seal injection flow.
- B. Increased level in the Primary Drains Transfer Tank.
- C. #1 seal leakoff is lower than normal.
- D. RCP Standpipe Hi level alarm lit.

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19. Given the following conditions:

- Unit 1 was initially at 100% power
- The crew started ramping the unit 10 minutes ago to perform a Turbine Valve Freedom Test
- T_{AVE} is presently 3 degrees higher than T_{REF}
- 1-MS-PT-1446, Channel III First Stage Pressure, is selected for control

Based on these plant conditions, which ONE of the following identifies how the steam dumps will respond if 1-MS-PT-1447, Channel IV First Stage Pressure fails LOW?

- A. Steam dumps arm but remain closed because there is insufficient demand signal.
- B. Steam dumps arm and ONLY banks 1 & 2 modulate open until T_{AVE} matches T_{REF} .
- C. Steam dumps DO NOT arm and are disabled since the T_{REF} input is failed LOW.
- D. Steam dumps arm and all valves modulate open until T_{AVE} matches T_{REF} .

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20. 10 CFR 50.46, ECCS Acceptance Criteria, states that the ECCS is designed to ensure peak cladding temperature is maintained less than or equal to _____ during a Large Break LOCA;
The CETC temperature that is used to monitor the Core Cooling CSF Status tree is _____.
- A. 1200°F;
the average temperature of ALL CETCs in that ICCM train.
 - B. 1200°F;
the average temperature of the five highest CETCs in that ICCM train.
 - C. 2200°F;
the average temperature of ALL CETCs in that ICCM train.
 - D. 2200°F;
the average temperature of the five highest CETCs in that ICCM train.

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21. 1-ECA-0.0, Loss of All AC Power, Attachment 4 (Attempting to Restore Power to 1H [1J] Emergency Bus) directs the crew to place all charging pumps in Pull-To-Lock if RCP _____ temperature exceeds 235°F; this action is taken to _____.

- A. Seal Water Outlet;
prevent damage to the RCP seal package
- B. Seal Water Outlet;
prevent damage to the thermal barrier heat exchanger
- C. Pump Radial Bearing;
prevent damage to the RCP seal package
- D. Pump Radial Bearing;
prevent damage to the thermal barrier heat exchanger

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22. Given the following conditions:

- The crew has tripped Unit 1 and initiated Safety Injection due to a loss of RCS inventory
- Conditions continue to degrade and CDA automatically actuates

Based on the above conditions, which ONE of the following identifies the automatic response of the Containment Cooling System?

- A. CARFs tripped when Safety Injection was initiated;
Cooling water to CARFs isolated when Safety Injection was initiated.
- B. CARFs tripped when CDA actuated;
Cooling water to CARFs isolated when Safety Injection was initiated.
- C. CARFs tripped when Safety Injection was initiated;
Cooling water to CARFs isolated when CDA actuated.
- D. CARFs tripped when CDA actuated;
Cooling water to CARFs isolated when CDA actuated.

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23. Given the following conditions:

- Following a reactor trip, Unit 1 was stabilized with all parameters on program and stable
- The crew initiated emergency boration in accordance with 1-ES-0.1, Reactor Trip Response

With 1-CH-P-1B initially in service, a loss of off-site power occurs.

Following the loss of offsite power, the OATC notes the following:

- 1-CH-P-1A breaker closed with 75 amps indicated
- 1-CH-P-1B breaker closed with 10 amps indicated
- 1-CH-P-1C secured
- Annunciator C-G6, RCP 1A-B-C LABYTH SEAL LO FLOW, is lit
- Annunciator C-C5, CHG PP TO REGEN HX HI-LO FLOW, is lit
- Annunciator C-A7, CHG PP 1C 15H7 LOCKOUT, is lit
- PRZR level 20% and **slowly decreasing**
- VCT level 44% and **slowly increasing**

Which ONE of the following identifies the **cause of these conditions**, and the **procedure that should be implemented** to correct these conditions?

- A. Discharge check valve failure on 1-CH-P-1B;
1-AP-49, Loss of Normal Charging.
- B. Charging line rupture upstream of 1-CH-FCV-1122;
1-AP-16, Excessive RCS Leakage.
- C. Alarms are consistent with the loss of offsite power;
0-AP-10, Loss of Electrical Power.
- D. Rupture of RCP seal injection line upstream of 1-CH-HCV-1186;
1-AP-33.2, Loss of RCP Seal Cooling.

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24. Following successful completion of maintenance, Unit 1 is exiting an outage that began 4 days ago.

Given the following conditions:

- The RCS is solid
- RCS temperature is 256°F and stable
- RCS pressure is 300 psig and stable
- RHR is in service

A loss of ALL instrument air (**inside and outside containment**) occurs, and the crew entered 1-AP-28, Loss of Instrument Air, but was unable to restore a source of air.

Which ONE of the following identifies the **RCS temperature response**, and the **action required** by 1-AP-28 assuming the crew is unable to restore IA pressure?

- A. RCS temperature will increase;
open RHR H/X CC Outlet Isolation Valves 1-CC-TV-103A & -103B locally.
- B. RCS temperature will decrease;
open RHR H/X CC Outlet Isolation Valves 1-CC-TV-103A & -103B locally.
- C. RCS temperature will increase;
adjust RHR Heat Exchanger Return Valves 1-CC-MOV-100A & -100B.
- D. RCS temperature will decrease;
adjust RHR Heat Exchanger Return Valves 1-CC-MOV-100A & -100B.

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25. Unit 1 is at 100% power and a loss of ALL CC flow has occurred.

In accordance with 1-AP-15, Loss of Component Cooling, the reactor shall be tripped and affected RCPs stopped if RCP _____ rises to 195°F.

- A. Motor Bearing temperature
- B. Pump Radial Bearing temperature
- C. Stator Winding temperature
- D. Seal Water Outlet temperature

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26. Given the following conditions:

- A large-break LOCA occurred with Unit 1 initially at 100% power
- A loss of offsite power occurs
- All equipment functioned as designed EXCEPT that 1J1, 480-Volt Emergency Bus in Rod Drive, deenergized due to an electrical fault

Based on these plant conditions, which ONE of the following identifies the Quench Spray and Recirc Spray pumps that have power available?

- A. BOTH Quench Spray pumps and ONLY three Recirc Spray pumps.
- B. ONLY one Quench Spray pump and ONLY three Recirc Spray pumps.
- C. BOTH Quench Spray pumps and ONLY two Recirc Spray pumps.
- D. ONLY one Quench Spray pump and ONLY two Recirc Spray pumps.

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27. Given the following conditions:

- A large-break LOCA occurred with Unit 1 initially at 100% power
- All equipment functions as designed EXCEPT that 1-QS-P-1A, "A" Quench Spray Pump, shaft shears on startup

Based on this malfunction, which ONE of the following describes the impact on the Quench Spray System, and on the Recirculation Spray System?

- A. ONLY ONE QS Spray Ring will receive flow;
ONLY ONE Inside Recirc Spray Pump sump will receive design flow from Quench Spray.
- B. ONLY ONE QS Spray Ring will receive flow;
BOTH Inside Recirc Spray Pump sumps will receive design flow from Quench Spray.
- C. BOTH QS Spray Rings will receive flow;
ONLY ONE Inside Recirc Spray Pump sump will receive design flow from Quench Spray.
- D. BOTH QS Spray Rings will receive flow;
BOTH Inside Recirc Spray Pump sumps will receive design flow from Quench Spray.

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28. Which ONE of the following describes the automatic operation of 1-QS-MOV-102A, Chemical Addition Tank outlet valve?

- A. 1-QS-MOV-102A will open **immediately** provided BOTH the "A" Quench Spray Pump breaker is closed AND CDA is actuated.
- B. 1-QS-MOV-102A will open **immediately** provided EITHER the "A" Quench Spray Pump breaker is closed OR CDA is actuated.
- C. 1-QS-MOV-102A will open **after a 5-minute time delay** provided BOTH the "A" Quench Spray Pump breaker is closed AND CDA is actuated.
- D. 1-QS-MOV-102A will open **after a 5-minute time delay** provided EITHER the "A" Quench Spray Pump breaker is closed OR CDA is actuated.

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29. Unit 1 is at 100% power.

The OATC notes that all PRZR heaters are energized, and RCS pressure is 2270 psig and rising.

Based on these plant conditions, which ONE of the following identifies the **failed channel** and includes the **plant response** if no operator action is taken?

- A. 1-RC-PT-1444 failed low;
1-RC-PCV-1455C will cycle open and closed
- B. 1-RC-PT-1444 failed low;
1-RC-PCV-1456 will cycle open and closed
- C. 1-RC-PT-1445 failed low;
1-RC-PCV-1456 will cycle open and closed
- D. 1-RC-PT-1445 failed low;
1-RC-PCV-1455C will cycle open and closed

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30. Given the following conditions:

- Unit 1 is at 100% power
- The Pressurizer Level Channel Defeat Switch is selected to position 461/460
- Annunciator B-G7, PRZ LO LEV HTRS OFF LETDOWN ISOL, alarms

The OATC notes the following:

- PRZR level is 66% and slowly increasing
- Demand on 1-RC-LC-1459G, PRZR Level Controller, is approximately 35% and slowly decreasing

Based on these plant conditions, which ONE of the following identifies the **failed instrument**, and the **Immediate Operator Action** required by 1-AP-3, Loss of Vital Instrumentation?

- A. 1-RC-LI-1460 is failed low;
Place 1-CH-FCV-1122, Charging Flow Control valve, in MANUAL and control level at program.
- B. 1-RC-LI-1460 is failed low;
Place Pressurizer Level Channel Defeat Switch in position 459/461, then verify Annunciator B-G7, PRZ LO LEV HTRS OFF LETDOWN ISOL, clears.
- C. 1-RC-LI-1461 is failed low;
Place 1-CH-FCV-1122, Charging Flow Control valve, in MANUAL and control level at program.
- D. 1-RC-LI-1461 is failed low;
Place Pressurizer Level Channel Defeat Switch in position 459/460, then verify Annunciator B-G7, PRZ LO LEV HTRS OFF LETDOWN ISOL, clears.

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31. Unit 1 is in Mode 6 with core off-load in progress.

A containment purge exhaust fan is started by the Backboards Operator. As a result of this action, reactor cavity level will _____ and spent fuel pit level will _____.

- A. increase slightly; decrease slightly
- B. increase slightly; not be affected
- C. not be affected; not be affected
- D. decrease slightly; increase slightly

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32. Which ONE of the following describes the actions required by 2-FR-S.1, Response to Nuclear Power Generation/ATWS, Attachment 4 (Remote Reactor Trip) if attempts to locally trip the reactor from the Rod Drive room are unsuccessful?
- A. De-energize BOTH 2A1 and 2C2 480-Volt Station Service Busses by opening their respective supply breakers.
 - B. De-energize BOTH 2A1 and 2B2 480-Volt Station Service Busses by opening their respective supply breakers.
 - C. Open BOTH Rod Drive M-G Set Motor Supply Breakers locally at the 2A1 and 2C2 480-Volt Station Service Busses.
 - D. Open BOTH Rod Drive M-G Set Motor Supply Breakers locally at the 2A1 and 2B2 480-Volt Station Service Busses.

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33. Unit 1 tripped from 100% power 22 minutes ago.

The following plant conditions exist:

- Intermediate Range Channel N-35 indicates 8×10^{-10} amps and stable.
- Intermediate Range Channel N-36 indicates 1×10^{-11} amps and stable.
- High voltage is de-energized on BOTH Source Range Channels N-31 & N-32.

1-ES-0.1, Reactor Trip Response, is in effect and the crew is at the step, "Check If Source Range Detectors Should Be Energized."

Based on these plant conditions, which ONE of the following identifies the **malfunction** that has occurred, and the **action required** by 1-ES-0.1?

- A. N-35 is **under-compensated**;
Manually energize Source Range Detectors using the Source Range Block and Reset switches.
- B. N-35 is **over-compensated**;
Manually energize Source Range Detectors using the Source Range Block and Reset switches.
- C. N-35 is **over-compensated**;
Energize Source Range Detectors by bypassing N-35 and removing the instrument power fuses.
- D. N-35 is **under-compensated**;
Energize Source Range Detectors by bypassing N-35 and removing the instrument power fuses.

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34. Core on-load has commenced and Containment Purge is in service on Unit 1.

1-RM-RMS-159, Containment Particulate Radiation Monitor, has just pegged high due to a malfunction of the monitor.

Which ONE of the following identifies the **automatic actuations** that will occur, and the **impacts of this failure on fuel movement** IAW 1-OP-4.1, Controlling Procedure for Refueling?

- A. ONLY Containment Purge Isolation;
OPS Manager approval is required to resume fuel movement.
- B. Containment Purge Isolation AND Control Room Bottle Air Dump;
OPS Manager approval is required to resume fuel movement.
- C. ONLY Containment Purge Isolation;
Fuel movement may continue without any additional approvals.
- D. Containment Purge Isolation AND Control Room Bottle Air Dump;
Fuel movement may continue without any additional approvals.

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35. The SG PORV controllers (1-MS-PCV-101A, B, & C) are designed to control RCS T_{AVE} at approximately _____; this is achieved by a controller **pot setting** of approximately _____.

- A. 551°F ; 5.5
- B. 551°F ; 7.0
- C. 556°F ; 5.5
- D. 556°F ; 7.0

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36. Given the following conditions:

- Unit 1 generator output breaker G-12 has just been closed following a reactor startup
- All control systems are aligned per startup procedures
- "A" train of steam dumps is isolated to repair 1-MS-TCV-1408A, which is de-energized and tagged out
- Main steam line pressure transmitter 1-MS-PT-1464 fails HIGH

Which ONE of the following identifies the **RCS temperature response**, and the **required action**?

- A. RCS temperature increases;
Manually insert rods to match T_{AVE} and T_{REF} .
- B. RCS temperature increases;
Verify rods automatically insert to match T_{AVE} and T_{REF} .
- C. RCS temperature decreases;
Close all MSTVs using Appendix R Switch.
- D. RCS temperature decreases;
Place both Steam Dump Interlock Switches to OFF/RESET.

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37. Given the following conditions:

- Unit 1 was operating at 100% power when a Main Steamline break occurred inside containment
- 1-E-2, Faulted Steam Generator isolation, has been completed
- The team transitioned to 1-ES-1.1, SI Termination, and has just completed isolating the BIT and establishing normal charging

The following plant conditions exist:

- Containment pressure is 19 psia and decreasing
- Intact SG narrow-range levels are 8% and increasing
- PRZR level is 16% and decreasing
- 1-CH-FCV-1122, Charging flow control valve is full open

Based on these plant conditions, which ONE of the following identifies the action required by 1-ES-1.1, SI Termination?

- A. Manually start charging pumps and align the BIT; go to 1-E-1, Loss of Reactor or Secondary Coolant.
- B. When Containment pressure is less than 13 psig, then stop Quench Spray Pumps; Continue in 1-ES-1.1.
- C. Isolate letdown; if PRZR level continues to decrease, then manually actuate SI.
- D. Stop feed flow to SGs; if cooldown continues, then close MSTVs and bypass valves.

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38. Because power is lost to the steam dump arming circuit, Attachment 24, (Unit 1 CRO Loss of Power Actions), of O-AP-10, Loss of Electrical Power, directs the operator to "Check SG PORVs controlling in AUTO or MANUAL due to loss of Steam Dumps" in the event of a loss of _____.
- A. 120-VAC Vital Bus I-I
 - B. 120-VAC Vital Bus I-II
 - C. 120-VAC Vital Bus I-III
 - D. 120-VAC Vital Bus I-IV

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39. Given the following conditions:

- Unit 1 is at 100% power when the crew notes degrading condenser vacuum
- The crew has entered 1-AP-14, Low Condenser Vacuum
- The Turbine Building operator has been dispatched to perform Attachment 2, Turbine Building Corrective Actions

The Turbine Building operator checks both condenser air ejector loop seal drain lines to condenser, and notes that one loop seal drain line is **hot** to the touch and the other is **cool** to the touch.

Which ONE of the following identifies the action required in accordance with 1-AP-14?

- A. Isolate the **hot** loop seal drain line and secure the associated set of main condenser air ejectors.
- B. Isolate the **hot** loop seal drain line; when at least 15 minutes have elapsed, then slowly reopen the loop seal drain isolation valve.
- C. Isolate the **cool** loop seal drain line and secure the associated set of main condenser air ejectors.
- D. Isolate the **cool** loop seal drain line; when at least 15 minutes have elapsed, then slowly reopen the loop seal drain isolation valve.

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40. Given the following conditions:

- Operators have transitioned to 1-FR-H.1, Response to Loss of Secondary Heat Sink.
- SG wide-range levels are approximately 50% and slowly decreasing.
- Operators are at Step 2 of 1-FR-H.1 and are unable to establish AFW flow to any of the SGs.

Which ONE of the following identifies the action required by 1-FR-H.1 with respect to the RCPs?

- A. Stop all but ONE RCP.
- B. Stop all RCPs.
- C. Maintain RCPs operating unless support conditions degrade.
- D. Maintain RCPs operating until bleed and feed criteria are met.

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41. Given the following conditions:

- Both units are initially at 100% power
- 2-SW-P-1B is tagged out, and Service Water is throttled

A loss of both Unit-1 4160-Volt Emergency buses occurs, and power is eventually restored to the 1H Emergency bus from the SBO diesel.

Which ONE of the following identifies how the Unit-1 Service Water pumps are operated in accordance with 1-ECA-0.0, Loss of All AC Power?

- A. 1-SW-P-1A and 1-SW-P-1B control switches are maintained in AUTO during 1-ECA-0.0 recovery actions;
1-SW-P-1A will be started **prior to** exiting 1-ECA-0.0.
- B. 1-SW-P-1A and 1-SW-P-1B control switches are maintained in AUTO during recovery actions;
1-SW-P-1A will be started **after** exiting 1-ECA-0.0.
- C. 1-SW-P-1A and 1-SW-P-1B control switches are placed in PULL-TO-LOCK during recovery actions;
1-SW-P-1A will be started **prior to** exiting 1-ECA-0.0.
- D. 1-SW-P-1A and 1-SW-P-1B control switches are placed in PULL-TO-LOCK during recovery actions;
1-SW-P-1A will be started **after** exiting 1-ECA-0.0.

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42. Given the following conditions:

- Unit 1 is at 25% power ramping up following a scheduled refueling
- Annunciator A-G1, CNDSR LO VAC C-9 PERM NOT AVAIL is received
- The OATC notes that condenser vacuum is 4 in Hg abs and slowly degrading
- The crew enters 1-AP-14, Low Condenser Vacuum

Which ONE of the following identifies the action required to mitigate these plant conditions?

- A. Go to 1-AP-2.2, Fast Load Reduction, reduce load and remove the main generator from service while continuing with 1-AP-14.
- B. Exit 1-AP-14, go to 1-AP-2.2, Fast Load Reduction, reduce load and remove the main generator from service.
- C. Trip the reactor and go to 1-E-0, Reactor Trip or Safety Injection, while continuing with 1-AP-14.
- D. Exit 1-AP-14, trip the reactor and go to 1-E-0, Reactor Trip or Safety Injection.

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43. Given the following conditions:

- Unit 1 is at 100% power and stable
- Following a lightening strike the OATC has identified that several instruments powered from Vital AC Bus 1-III have been lost

Which ONE of the following failed instruments requires action within 1 Hour in accordance with Technical Specifications?

- A. Pressurizer pressure protection channel III, 1-RC-PT-1457.
- B. Pressurizer level channel III, 1-RC-LT-1461.
- C. "B" SG steam flow channel III, 1-MS-FT-1484
- D. "A" SG narrow-range level channel III, 1-FW-LT-1476

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44. Which ONE of the following identifies the **power level and sequence** for securing a Main Feedwater (MFW) pump in accordance with 1-AP-2.2, Fast Load Reduction?

At approximately 55% power, _____; at approximately 50% power, _____.

- A. open one MFW recirc valve;
shutdown one MFW pump.
- B. shutdown one MFW pump;
open one MFW recirc valve.
- C. close one MFW recirc valve;
shutdown one MFW pump.
- D. shutdown one MFW pump;
close one MFW recirc valve.

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45. Given the following conditions:

- Unit 1 is at 70% power
- "B" Main Feedwater (MFW) pump is tagged out

The "C" MFW pump trips.

Which ONE of the following describes the plant response?

(Assume no operator action.)

- A. MFRVs modulate open, but SG levels continue to decrease.
- B. MFRVs modulate open and maintain SG levels.
- C. MFRVs and bypass valves modulate open and maintain SG levels.
- D. MFRVs and bypass valves fully open, but SG levels continue to decrease.

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46. With AFW in service to supply SG feedwater, ECST level suddenly begins to decrease rapidly due to a rupture in the tank.

Which ONE of the following identifies the **preferred** source of alternate makeup water used to supply AFW pump suction?

- A. Fire Protection System using **motor-driven** pump 1-FP-P-1.
- B. **Standby** 300,000-gallon condensate storage tank.
- C. **In-service** 300,000-gallon condensate storage tank.
- D. Fire Protection System using **diesel-driven pump** 1-FP-P-2.

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47. Given the following conditions:

- Unit 1 is at 100% power
- AFW pump 1-FW-P-3A is tagged out for Maintenance

A loss of offsite power occurs, and all equipment functions as designed EXCEPT the 1J EDG locked out.

Based on these plant conditions, which ONE of the following identifies the realignment that will provide flow to all 3 SGs **AND** also allows the BOP the ability to control AFW flow rate to each SG from the control board?

- A. Align 1-FW-P-2 to the MOV header.
- B. Align 1-FW-P-2 to the HCV header.
- C. Align 1-FW-P-3B to the MOV header.
- D. Align 1-FW-P-3B to the HCV header.

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48. The NORMAL source of cooling water for charging pumps is the _____; in the event of a loss of the normal source, alternate cooling is aligned from the _____.

- A. Service Water System ; Component Cooling System
- B. Service Water System ; Fire Protection System
- C. Component Cooling System ; PG Water System
- D. Component Cooling System ; Fire Protection System

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49. Given the following conditions:

- Unit 1 is at 50% power
- 15F3, "F" Transfer Bus Supply to 1H Bus, is tagged out for breaker maintenance
- The 1H 4160-Volt Emergency bus is powered from the 1B Station Service Bus

While checking neutral bus volts, the OATC inadvertently takes breaker 15B2, Station Service Transformer Supply to 1B Station Service Bus, to TRIP.

As a result of this action, **final** status of the 1B Station Service Bus will be _____, and the **final** status of the 1H 4160-Volt Emergency bus will be _____.

- A. de-energized; energized
- B. energized; energized
- C. energized; de-energized
- D. de-energized; de-energized

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50. A Loss of All AC has just occurred on Unit 1.

Five minutes have elapsed, and a source of power has not yet been restored.

The operator should expect the voltage on all four (4) of the 125-Volt DC Busses to be _____ their pre-event values. Over time, vital DC bus 1-I voltage would be expected to drop _____, as compared to vital DC bus 1-II voltage.

- A. approximately the same as ; at approximately the same rate
- B. approximately the same as ; at a slower rate
- C. approximately 10 volts lower than ; at approximately the same rate
- D. approximately 10 volts lower than ; at a slower rate

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51. Which ONE of the following methods ensures that only one DC bus at a time is supplied from the swing charger?
- A. Each swing charger supply breaker to the DC bus has a Key-operated interlock mechanism.
 - B. The swing charger output breakers are interlocked such that both breakers trip if you attempt to close one with the other one already closed.
 - C. Each swing charger has a single dedicated plug-in type output breaker.
 - D. The swing charger output breakers are electrically interlocked to prevent simultaneous closure.

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52. When the emergency diesel generator air compressors are swapped to the Lister diesels, the Lister diesel _____, and air bank pressure is maintained by the _____ loading and unloading of the air compressor.
- A. will run continuously; automatic
 - B. will run continuously; manual
 - C. is manually started each time air pressure drops to 150 psig; automatic
 - D. is manually started each time air pressure drops to 150 psig; manual

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53. Unit 1 is at 100% power.

After receiving annunciator J-E8, INSTRUMENT AIR LOW PRESS, operators entered 1-AP-28, Loss of Instrument Air.

The BOP notes Instrument Air pressure has decreased to _____. 1-AP-28 directs the crew to trip the reactor and close Main Steam Trip Valves. These actions are taken primarily to _____.

- A. 68 psig ; prevent an undesired automatic Safety Injection.
- B. 68 psig ; prevent an uncontrolled RCS cooldown.
- C. 88 psig ; prevent an undesired automatic Safety Injection.
- D. 88 psig ; prevent an uncontrolled RCS cooldown.

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54. If an oil fire occurs in the North Fuel Oil Pump House, a _____ will actuate to suppress the fire; the fire is classified as a _____.

- A. pre-action sprinkler system ; Class B fire
- B. pre-action sprinkler system ; Class A fire
- C. high-pressure CO₂ system ; Class B fire
- D. high-pressure CO₂ system ; Class A fire

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55. Which ONE of the following components is automatically affected by a high alarm on 1-GW-RI-178-1, MGP Process Vent Radiation Monitor?

- A. Containment Vacuum Pump Discharge Valves
- B. Low Level Liquid Waste Tank Vents
- C. Boron Recovery Tank Vents
- D. Containment Purge Exhaust Valves

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56. Both units are at 100% power.

Breaker 15G10, 1G/2G bus crosstie, will automatically close if power is lost to the _____.

- A. "A" RSST provided lake level is **greater than** 251 feet
- B. "A" RSST provided lake level is **less than** 251 feet
- C. "C" RSST provided lake level is **greater than** 251 feet
- D. "C" RSST provided lake level is **less than** 251 feet

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57. Given the following conditions:

- Both units are at 100% power
- 1-SW-P-1A and 2-SW-P-1A are running
- Unit 1 experiences a large-break LOCA

Service Water flow to the CCHXs isolates _____.

- A. on Unit 1 ONLY, and 3 Service Water pumps will be running.
- B. on BOTH units, and 3 Service Water pumps will be running.
- C. on Unit 1 ONLY, and 4 Service Water pumps will be running.
- D. on BOTH units, and 4 Service Water pumps will be running.

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58. Unit 1 is at 100% power with approximately 960 MW and 100 MVAR OUT.

The OATC notes the following conditions:

- Sustained Generator output voltage increase
- MVAR sustained increase consistent with Generator output voltage
- MW stable

Which ONE of the following identifies the required operator actions based on these plant conditions?

- A. Maintain Voltage Regulator in AUTO and adjust voltage using Base Adjust;
Maintain less than 200 MVAR OUT.
- B. Maintain Voltage Regulator in AUTO and adjust voltage using Base Adjust;
Maintain less than 200 MVAR IN.
- C. Place Voltage Regulator control switch in OFF and adjust voltage using Base Adjust;
Maintain less than 200 MVAR OUT.
- D. Place Voltage Regulator control switch in OFF and adjust voltage using Base Adjust;
Maintain less than 200 MVAR IN.

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59. The Service Air Compressors are powered from their respective unit's _____ and the Instrument Air Compressors are powered from their respective unit's _____.

- A. "B" 480-Volt Station Service Bus ; "H" 480-Volt Emergency Bus
- B. "B" 480-Volt Station Service Bus ; "J" 480-Volt Emergency Bus
- C. "G" 480v Station Service Bus ; "H" 480-Volt Emergency Bus
- D. "G" 480-Volt Station Service Bus ; "J" 480-Volt Emergency Bus

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60. If Chilled Water to Containment is lost, the indicated containment partial air pressure will _____ and the digital containment partial air pressure indicators are _____.

- A. decrease ; inoperable
- B. decrease ; operable
- C. increase ; inoperable
- D. increase ; operable

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61. Unit 1 has experienced a DBA LOCA.

The following plant conditions exist:

- Containment pressure is 25 psia
- Containment sump level is 11 feet 4 inches

Which ONE of the following identifies the status of the Containment CSF Status Tree?

- A. An ORANGE path exists for both Containment Pressure and Containment Sump level.
- B. An ORANGE path exists for Containment Pressure ONLY.
- C. An ORANGE path exists for Containment Sump level ONLY.
- D. An ORANGE path does NOT exist for Containment Pressure or Containment Sump level.

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62. Both units are at 100% power with no equipment out of service (except as noted below).

Which ONE of the following events would initiate an automatic start of the SBO diesel?

- A. With "C" RSST out of service, a loss of 34.5 KV bus #4 occurs.
- B. With "B" RSST out of service, a loss of 34.5 KV bus #4 occurs.
- C. Spurious trip of breaker 15F1, "F" transfer bus supply.
- D. Spurious trip of breaker 15D1, "D" transfer bus supply.

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63. In order to maintain an active license, a Reactor Operator must stand a **MINIMUM** of ____ 12-hour shifts per calendar quarter.

- A. 4
- B. 7
- C. 5
- D. 8

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64. Given the following conditions:

- Unit 1 is at 100% power
- Annunciator B-H2, PRZ POWER RELIEF LINE HI TEMP is received
- During the next 1 hour, PRT level increases from 72% to 76%
- RCS Leakage **prior to the event** was 0.5 gpm Identified, and 0.3 gpm Unidentified

Based on the above conditions, which ONE of the following describes the Technical Specification implications of the leaking PORV?

(Reference provided)

- A. The limit for RCS Operational Leakage has NOT been exceeded.
- B. The limit for Identified Leakage has been exceeded.
- C. The limit for Pressure Boundary Leakage has been exceeded.
- D. The limit for RCS Pressure Isolation Valve (PIV) Leakage has been exceeded.

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65. The status of annunciator patch cords is checked on a _____ basis using 0-GOP-2.7, Annunciator Patchcord Control, and the _____ is used to track the total number of disabled annunciators.
- A. quarterly; Central Reporting System
 - B. quarterly; Operations Aggregate Impact Report
 - C. weekly; Central Reporting System
 - D. weekly; Operations Aggregate Impact Report

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66. The SG N-16 Radiation Monitors are required by Technical Requirements in _____, and can not be declared functional until reactor power is at least _____.

- A. Modes 1, 2, and 3 ; 5%
- B. Modes 1, 2, and 3 ; 25%
- C. Modes 1 & 2 ; 5%
- D. Modes 1 & 2 ; 25%

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67. In accordance with VPAP-2101, Radiation Protection Program, a Radiation Worker's Annual Administrative Dose Limit for Total Effective Dose Equivalent (TEDE) is _____ rem/calendar year at the worker's home site.

- A. 1
- B. 2
- C. 3
- D. 4

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68. Unit 1 is at 100% power.

1-SV-RM-121, Condenser Air Ejector Radiation Monitor, spikes high resulting in a Hi alarm AND a Hi-Hi alarm on the drawer, and then the indication returns to normal.

Based on the above, which ONE of the following describes the response of 1-SV-RM-121, Condenser Air Ejector Radiation Monitor?

- A. The Hi alarm clears when the indication returns to normal; the Hi-Hi alarm remains in and must be reset by the operator.
- B. The Hi alarm clears when the indication returns to normal; the Hi-Hi alarm remains in and must be reset by I&C.
- C. The Hi-Hi alarm clears when the indication returns to normal; the Hi alarm remains in and must be reset by the operator.
- D. The Hi-Hi alarm clears when the indication returns to normal; the Hi alarm remains in and must be reset by I&C.

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69. 1-FR-H.1, Response to Loss of Secondary Heat Sink, is in effect.

When attempting to establish SG feed flow from the Condensate System, there is a NOTE prior to the step "Initiate depressurization of all SGs to less than 610 psig by dumping steam to condenser at maximum rate."

This NOTE states that each Main Steamline flow should be kept less than 1.0E6 LBM/HR.

The purpose of this NOTE is to remind the operator that exceeding 1.0E6 LBM/HR may result in

- A. a RCS cooldown rate in excess of Technical Specification limits.
- B. a challenge to the PTS status tree.
- C. an inadvertent Steamline DP Safety Injection.
- D. an undesired Main Steamline Isolation.

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70. Once the TSC is fully operational, the relief Station Emergency Manager will assume all of the following responsibilities from the on-shift SEM **EXCEPT** _____.
- A. authorizing notification to state and local governments.
 - B. classifying the emergency (escalation/de-escalation).
 - C. making protective action recommendations (PAR).
 - D. authorizing deviations to procedures pursuant to 10 CFR 50.54x.

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71. Operators are responding to a large-break LOCA with a loss of offsite power.

The team is implementing 1-E-1, Loss of Reactor or Secondary Coolant.

The OATC reports that the following alarms have just been received:

- F-E8, AFW SUPPLY 20 MIN WATER REMAINING
- J-A2, RWST LO LEVEL
- H-H1, EMER DIESEL GEN #1H DIFFERENTIAL
- J-F5, LHSI PP 1B LO OR OL TRIP

Based on these alarms, the crew will _____.

- A. verify LHSI pump suction has transferred to containment sump and continue in 1-E-1, Loss of Reactor or Secondary Coolant.
- B. perform 1-AP-22.5, Loss of Emergency Condensate Storage Tank 1-CN-TK-1, in order to preclude implementing 1-FR-H.1, Loss of Secondary Heat Sink.
- C. transition to 1-ES-1.3, Transfer to Cold Leg Recirculation, then return to 1-E-1, Loss of Reactor or Secondary Coolant.
- D. transition to 1-ES-1.3, Transfer to Cold Leg Recirculation, then transition to 1-ECA-1.1, Loss of Emergency Coolant Recirculation.

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72. Operators have entered 1-ECA-1.2, LOCA Outside Containment.

1-ECA-1.2 will have the operator isolate cold leg injection piping from _____, and if RCS pressure is **INCREASING** AFTER the isolation, the crew will transition to _____.

- A. High-Head SI pumps ; 1-E-1, Loss of Reactor or Secondary Coolant.
- B. High-Head SI pumps ; 1-ECA-1.1, Loss of Emergency Coolant Recirculation.
- C. Low-Head SI pumps ; 1-ECA-1.1, Loss of Emergency Coolant Recirculation.
- D. Low-Head SI pumps ; 1-E-1, Loss of Reactor or Secondary Coolant.

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73. Unit 1 tripped from 100% power, and a loss of secondary heat sink occurred.

The following plant conditions exist:

- The crew is currently in 1-FR-H.1, Response to Loss of Secondary Heat Sink
- Bleed and feed has been established
- A Main Steamline break occurs inside containment and CDA actuates, but only one Quench Spray pump started
- RCS cold-leg temperatures have decreased to 265°F

Based on these conditions, which ONE of the following identifies the correct operator response?

- A. Reset CDA, reset Phase 'B', and place instrument air back in service to PORVs.
- B. Transition to 1-FR-Z.1, Response to High Containment Pressure.
- C. Transition to 1-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition.
- D. Verify proper alignment of equipment using 1-E-0, Reactor Trip or Safety Injection.

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74. Unit 1 was operating at 100% power when a LOCA occurred.

The crew has just transitioned from 1-E-1, Loss of Reactor or Secondary Coolant, to 1-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition.

The following plant conditions exist:

- Containment pressure is 15 psia and is slowly trending down
- All RCPs are stopped
- RVLIS Full Range is reading 100%
- RCS subcooling based on Core Exit TCs is 105°F
- RCS pressure is 850 psig

Based on these plant conditions, which ONE of the following identifies the **actions the crew will perform** in accordance with 1-FR-P.1, and the **reason for these actions**?

- A. Remain in 1-FR-P.1, terminate SI and depressurize to minimize subcooling in order to limit pressure stress on the vessel.
- B. Exit 1-FR-P.1 and return to procedure step in effect, pressure is too low for PTS to be a concern.
- C. Exit 1-FR-P.1 and go to 1-ES-1.1, SI Termination, SI must be terminated promptly to mitigate the PTS condition.
- D. Remain in 1-FR-P.1, leave SI in service and determine soak requirements in order to minimize thermal stresses during subsequent recovery actions.

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75. Given the following conditions:

- Unit 1 has experienced a LOCA
- After establishing Cold Leg Recirculation, operators observed indication of sump blockage
- The crew has just transitioned to 1-ECA-1.1, Loss of Emergency Recirculation Capability

The STA reports an ORANGE path on Containment Pressure.

Based on these plant conditions, which ONE of the following identifies the crew response, and the reason for their response?

- A. Remain in 1-ECA-1.1; FRPs are not implemented until specifically directed by 1-ECA-1.1.
- B. Remain in 1-ECA-1.1; 1-FR-Z.1 is not to be performed as long as 1-ECA-1.1 is in effect.
- C. Immediately transition to 1-FR-Z.1 and operate Containment Depressurization Systems as directed, then return to 1-ECA-1.1; precludes a Red Path on the Containment status tree.
- D. Immediately transition to 1-FR-Z.1; Verify Phase A Isolation and Steamline Isolation, then return to 1-ECA-1.1; precludes a Red Path on the Containment status tree.

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76. Given the following conditions:

- Unit 1 is at 100% power
- VCT level is initially 52%
- VCT pressure is initially 30 psig

The OATC notes 1-CH-LCV-1115A, VCT Level Control valve, is in the DIVERT position.

The following conditions exist:

- VCT automatic makeup initiates
- 1-CH-LC-1112C, VCT Level Controller, indicates 100% demand
- VCT level is stable at 23%
- VCT pressure is stable at 17 psig

Based on the change in plant conditions, leakoff from the **RCP number 2 seal** to the standpipe will

 .
To mitigate this event, the crew will enter 1-AP-16, Increasing Primary Plant Leakage, and .

- A. increase;
 isolate letdown by closing 1-CH-HCV-1200A, B, & C, and 1-CH-LCV-1460A & B.
- B. increase;
 align 1-CH-LCV-1115A to VCT by locally opening breaker 7 on 1-EP-CB-26B.
- C. decrease;
 isolate letdown by closing 1-CH-HCV-1200A, B, & C, and 1-CH-LCV-1460A & B.
- D. decrease;
 align 1-CH-LCV-1115A to VCT by locally opening breaker 7 on 1-EP-CB-26B.

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77. Unit 1 is in Mode 4 with a heatup in progress following a scheduled refueling outage.

The following plant conditions exist:

- RHR is in service
- RCS temperature is 270°F
- SI accumulator pressures and levels are all at normal operating level and pressure
- SI accumulator MOVs are all CLOSED

The Safeguards watchstander reports the following:

- The breaker for "B" SI accumulator MOV is ON
- The breaker for "C" SI accumulator MOV is OFF

Based on these plant conditions, which ONE of the following identifies the **action to be taken**, and the **reason for the action**?

- A. Place the breaker for "C" SI accumulator MOV in ON;
SI accumulators are maintained available for Shutdown LOCA mitigation concerns.
- B. Place the breaker for "C" SI accumulator MOV in ON;
SI accumulator MOVs are energized to prepare for the change to Mode 3.
- C. Place the breaker for "B" SI accumulator MOV in OFF;
Power is removed from the MOVs to preclude an inadvertent dilution of the RCS.
- D. Place the breaker for "B" SI accumulator MOV in OFF;
Power is removed from the MOVs for RCS overpressure protection.

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78. Given the following:

- Unit 1 is at 75% power, ramping up at 0.3%/minute to return to full power

The following events occur:

- Annunciator A-D1, Rod Control Urgent failure is received
- The OATC reports that AUTO rod motion has stopped
- The ramp was held to investigate the alarm
- Local observation confirms the alarm is in the 2BD Power Cabinet

Based on these plant conditions, which ONE of the following identifies the **Technical Specification implications** and includes the **actions required by 1-AR-A-D1, Rod Control Urgent Failure**?

- A. Control Rods are INOPERABLE;
Operate Rods in MANUAL to maintain Tave and Tref matched until the problem is corrected.
- B. Control Rods are OPERABLE;
Operate Rods in MANUAL to maintain Tave and Tref matched until the problem is corrected.
- C. Control Rods are INOPERABLE;
Adjust Turbine load or RCS boron concentration to maintain Tave and Tref matched until the problem is corrected.
- D. Control Rods are OPERABLE;
Adjust Turbine load or RCS boron concentration to maintain Tave and Tref matched until the problem is corrected.

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79. Both units are at 100% power.

The Technical Specification LCO for the Component Cooling Water (CC) System requires _____ to be operable. The basis for this requirement is to ensure that _____.

- A. 3 CC subsystems;
one unit can be cooled down rapidly while the other unit is maintained at full power
- B. 3 CC subsystems;
both units can be cooled down rapidly
- C. 4 CC subsystems;
one unit can be cooled down rapidly while the other unit is maintained at full power
- D. 4 CC subsystems;
both units can be cooled down rapidly

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80. Given the following conditions:

- Unit 1 tripped from 100% power due to a small-break LOCA
- RCS temperature is stable at approximately 500°F
- All SG pressures are stable at approximately 670 psig
- Containment pressure is 21 psia and increasing 1 psia every 30 minutes
- CDA has not actuated

Operators have transitioned from 1-E-0, Reactor Trip or Safety Injection, to 1-E-1, Loss of Reactor or Secondary Coolant.

Based on these plant conditions, which ONE of the following identifies the action(s) required by 1-E-1?

- A. Start Outside Recirc Spray pumps and inject the Chemical Addition Tank.
- B. Start Outside Recirc Spray pumps, but DO NOT inject the Chemical Addition Tank.
- C. Start Quench Spray pumps and inject the Chemical Addition Tank.
- D. Start Quench Spray pumps, but DO NOT inject the Chemical Addition Tank.

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81. The crew is performing 1-ES-0.1, Reactor Trip Response, and is establishing emergency boration due to four (4) control rods indicating greater than 10 steps.

The crew was unable to open 1-CH-MOV-1350, Emergency Boration valve from the control room or locally.

Based on the given conditions, which ONE of the following identifies the **valve manipulations required** to align the boration flowpath IAW the procedure in effect, and includes the **indication used** to determine when the required amount of boric acid has been added?

- A. Open 1-CH-MOV-1115B & D, charging pump suction from RWST, then close 1-CH-MOV-1115C & E, charging pump suction from VCT;
Charging flow
- B. Open 1-CH-MOV-1115B & D, charging pump suction from RWST, then close 1-CH-MOV-1115C & E, charging pump suction from VCT;
RWST level
- C. Open 1-CH-FCV-1113A, boric acid to blender, and 1-CH-241, manual emergency borate valve;
Boric Acid and PG Controller Integrators
- D. Open 1-CH-FCV-1113A, boric acid to blender, and 1-CH-241, manual emergency borate valve;
Boric Acid Storage Tank level

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82. Given the following conditions:

- Unit 1 is in Mode 5 for drained-down RCS maintenance
- Reactor coolant loops are isolated
- RCS level is +12" above centerline
- A loss of RHR occurs
- The crew is performing actions of 1-AP-11, Loss of RHR
- RCS temperature is rising, and NEITHER RHR pump can be started

Which ONE of the following describes the **preferred method**, and the **actions that will be taken** to restore core cooling in accordance with 1-AP-11?

- A. Hot Leg Injection Forced Feed and Spill;
start ONE charging pump, and if necessary, ONE LHSI pump.
- B. Cold Leg Injection Forced Feed and Spill;
start TWO charging pumps and BOTH LHSI pumps.
- C. Cold Leg Injection Forced Feed and Spill;
start ONE charging pump, and if necessary, ONE LHSI pump.
- D. Hot Leg Injection Forced Feed and Spill;
start TWO charging pumps and BOTH LHSI pumps.

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83. Given the following conditions:

- Unit 1 was initially in Mode 2 starting up following a reactor trip
- Burnup is 14,000 MWD/MTU
- The "A" main steamline failed catastrophically inside containment
- Operators have completed 1-E-0, Reactor Trip or Safety Injection and are preparing to transition
- The OATC notes that "A" loop cold-leg temperature indicates 325°F

Based on these plant conditions, which ONE of the following identifies **the procedure** operators will implement upon leaving 1-E-0, and **the indication** that will be used to monitor the Subcriticality CSF Status Tree?

- A. 1-FR-P.2, Response to Anticipated Pressurized Thermal Shock Condition;
Source Range SUR.
- B. 1-FR-P.2, Response to Anticipated Pressurized Thermal Shock Condition;
Gamma-Metrics Wide-Range.
- C. 1-E-2, Faulted Steam Generator Isolation;
Source Range SUR.
- D. 1-E-2, Faulted Steam Generator Isolation;
Gamma-Metrics Wide-Range.

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84. Given the following conditions:

- Unit 1 is at 100% power
- RCS boron is 1120 ppm
- Engineering identified calculation errors during the previous Main Steam Safety Valve (MSSV) Testing

The data was recalculated, and the following lists the **actual** setpoints for the affected SG MSSVs:

MS-SV-101A -- 1092 psig	MS-SV-102B -- 1103 psig
MS-SV-103A -- 1115 psig	MS-SV-103B -- 1120 psig
MS-SV-104A -- 1160 psig	MS-SV-105B -- 1170 psig

Which ONE of the following identifies the Technical Specification **Required Action**, and the Technical Specification **Bases for the action**?
(Reference provided)

- A. Reduce power to < 52% RTP within 4 hours;
ensure primary-to-secondary pressure limitations are not exceeded.
- B. Reduce power to < 37% RTP within 4 hours and reduce PR HI Flux trip to a maximum of 37% RTP within 36 hours;
ensure primary-to-secondary pressure limitations are not exceeded.
- C. Reduce power to < 52% RTP within 4 hours;
provide protection against overpressurizing the Reactor Coolant System.
- D. Reduce power to < 37% RTP within 4 hours and reduce PR HI Flux trip to a maximum of 37% RTP within 36 hours;
provide protection against overpressurizing the Reactor Coolant System.

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85. Given the following conditions:

- Unit 1 is at 25% power
- The shift is raising power at 0.3% per minute IAW 1-OP-2.1, Unit Startup from Mode 2 to Mode 1

The following alarms are received in succession:

- EH FLUID RESERVOIR LOW LEVEL
- EH FLUID RESERVOIR LOW-LOW LEVEL
- HP FLUID PUMP LOCKOUT

Which ONE of the following identifies the correct operator response?

- A. Go to 1-AP-2.1, Turbine Trip Without Reactor Trip Required; place the running EHC pump in PULL-TO-LOCK.
- B. Go to 1-AP-2.1, Turbine Trip Without Reactor Trip Required; verify the running EHC pump tripped.
- C. Go to 1-E-0, Reactor Trip or Safety Injection; verify the running EHC pump tripped.
- D. Go to 1-E-0, Reactor Trip or Safety Injection; place the running EHC pump in PULL-TO-LOCK.

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86. Given the following conditions:

- Unit shutdown was in progress for scheduled refueling
- Power was held, and the unit has been stabilized at 40% because the "A" MFRV did not appear to be responding to decreasing controller demand
- Local inspection revealed that "A" MFRV is mechanically bound, and is NOT capable of closing

Based on these plant conditions, which ONE of the following completes the statement to identify the **safety-related function that is not met**, and the associated Technical Specification **required action**?

The "A" MFRV is NOT capable of providing isolation _____. TS-required action is to _____.

- A. following a reactor trip to prevent an uncontrolled RCS cooldown;
enter information-only action for "A" MFRV.
- B. following a high-energy line break on the "A" SG secondary side;
enter information-only action for "A" MFRV.
- C. following a reactor trip to prevent an uncontrolled RCS cooldown;
close OR isolate "A" MFRV within 72 hours.
- D. following a high-energy line break on the "A" SG secondary side;
close OR isolate "A" MFRV within 72 hours.

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87. Given the following conditions:

- Unit 1 was initially at 100% power with 1H EDG tagged out for voltage regulator replacement
- A loss of offsite power occurred, and 1J EDG tripped on overspeed and cannot be restarted
- Letdown automatically isolated due to decreasing PRZR level, and PRZR level is still slowly decreasing

The crew is performing 1-ECA-0.0, Loss of All AC Power.

Based on these plant conditions, which ONE of the following identifies the **procedure used to restore power**, and the **recovery actions once power is restored**?

- A. Use 0-OP-6.4, Operation of the SBO Diesel to energize an Emergency Bus;
Following power restoration, manually actuate Safety Injection and go to 1-ECA-0.2, Loss of All AC Power with SI Required.
- B. Use 0-AP-10, Loss of Electrical Power to energize an Emergency Bus;
Following power restoration, manually actuate Safety Injection and go to 1-ECA-0.2, Loss of All AC Power with SI Required.
- C. Use 0-OP-6.4, Operation of the SBO Diesel to energize an Emergency Bus;
Following power restoration, go to 1-ECA-0.2, Loss of All AC Power with SI Required and manually load required equipment.
- D. Use 0-AP-10, Loss of Electrical Power to energize an Emergency Bus;
Following power restoration, go to 1-ECA-0.2, Loss of All AC Power with SI Required and manually load required equipment.

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88. Given the following conditions:

- Unit 1 is at 90% power
- "A" & "C" MFW pumps are running, and "B" MFW pump is tagged out
- "A" & "C" Condensate pumps are running, and "B" Condensate pump is tagged out

The following alarms and conditions occur:

- G-G6, CONDENSATE PP 1A-1B-1C AUTO TRIP, alarms and the OATC notes that "A" Condensate pump is tripped
- F-B6, MAIN FD PPS SUCT HDR LO PRESS, and F-B5, MAIN FD PPS LO DIFF PRESS, are subsequently received
- MFW pump suction pressure is 270 psig and slowly lowering
- MFW pump differential pressure is 680 psig and slowly lowering

Based on these plant conditions, which ONE of the following identifies the direction(s) the SRO should provide to the OATC?

- A. Reduce turbine load until the MAIN FD PPS LO DIFF PRESS alarm is clear.
- B. Reduce turbine load until steam flow is less than available feed flow.
- C. Trip the reactor and go to 1-E-0, Reactor Trip or Safety Injection.
- D. Reduce turbine load until MFW pump suction pressure is greater than 300 psig.

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89. Given the following conditions:

- Unit 1 is at 100% power
- Annunciator H-B2, BATTERY CHGR 1-II TROUBLE alarms
- Battery Charger 1-II DC Output breaker has tripped and CANNOT be reset

Based on these plant conditions, which ONE of the following identifies the **Technical Specification required action**, and the **action required by AR-H-B2**?

- A. Restore DC electrical power subsystem to OPERABLE status within 2 hours;
Place battery charger 1C-I in service.
- B. Restore DC electrical power subsystem to OPERABLE status within 6 hours;
Place battery charger 1C-I in service.
- C. Restore DC electrical power subsystem to OPERABLE status within 2 hours;
Place battery charger 1C-II in service.
- D. Restore DC electrical power subsystem to OPERABLE status within 6 hours;
Place battery charger 1C-II in service.

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90. Given the following conditions:

- Unit 1 has experienced a LOCA with multiple equipment failures
- The crew is implementing 1-FR-C.1, Response to Inadequate Core Cooling
- Attempts to establish safety injection flow have been unsuccessful
- The crew is at step 20 of 1-FR-C.1, which directs the operator to "Check if RCPs Should be Started"
- Core-exit TCs (CETC) are 1250°F and rising at approximately 3°F/min
- All RCPs are stopped

SG levels are as follows:

- "A" -- 25% **narrow-range** and slowly increasing
- "B" -- 30% **narrow-range** and stable
- "C" -- 50% **wide-range** and slowly decreasing

Containment pressure peaked at 38 psia, and is now 24 psia and slowly decreasing.

Based on these plant conditions, which ONE of the following identifies the **actions and sequence** required by 1-FR-C.1?

- A. Start "A" RCP; if CETCs remain the same after "A" RCP is running, then start "B" RCP; if CETCs remain the same after "B" RCP is running, then open PRZR PORVs and block valves.
- B. Start "A" RCP; if CETCs remain the same after "A" RCP is running, then start "B" RCP; if CETCs remain the same after "B" RCP is running, then open all Reactor vent valves and PRZR vent valves.
- C. Start ALL RCPs; if CETCs remain the same after all RCPs are running, then open PRZR PORVs and Block Valves, and open all available RCS vent paths to containment.
- D. Start ALL RCPs; if CETCs remain the same after all RCPs are running, then go to 1-SACRG-1, Severe Accident Control Room Guideline Initial Response.

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91. Given the following conditions:

- Both units are at 100% power
- 1-SW-P-1A and 1-SW-P-1B are running
- Service Water is throttled in accordance with 0-OP-49.6, Service Water System Throttling Alignment

The OATC observes 1-SW-P-1A discharge pressure is 0 psig, and motor current is 10 amps.

Which ONE of the following identifies the **procedurally required action**, and describes the **status of the SW system AFTER** the applicable pump is started?

- A. Start 2-SW-P-1A;
The Service Water System can perform its required safety function in the event of a DBA only if NO additional failures occur.
- B. Start 2-SW-P-1A;
The Service Water System can perform its required safety function in the event of a DBA assuming ONE additional failure.
- C. Start 2-SW-P-1B;
The Service Water System can perform its required safety function in the event of a DBA only if NO additional failures occur.
- D. Start 2-SW-P-1B;
The Service Water System can perform its required safety function in the event of a DBA assuming ONE additional failure.

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92. The following initial conditions existed:

- Both Units at 100% power
- The 1H Diesel Generator is tagged out for pre-planned minor maintenance

The following alarms and indications occur:

- Annunciator 1T-D3, FREQUENCY 59.8 HERTZ
- Annunciator 2T-D3, FREQUENCY 59.8 HERTZ
- Operators have verified the alarms are valid
- 500kV switchyard voltage is 503kV and stable
- System Operator reports frequency is 59.6 Hertz and stable

Based on these plant conditions, which ONE of the following identifies the **most limiting Technical Specification required action?**

(REFERENCE PROVIDED)

- A. Restore one offsite circuit to operable status within 24 hours.
- B. Restore 1H EDG to operable status within 14 days.
- C. Restore either the offsite circuit or the 1H EDG to operable within 12 hours.
- D. Enter LCO 3.0.3 immediately.

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93. For the Emergency Condensate Storage Tank to be OPERABLE, it must contain a minimum volume of _____; the Basis for this requirement is to _____.

- A. 100,000 gallons ; maintain the unit in MODE 3 for 8 hours.
- B. 100,000 gallons ; maintain the unit in MODE 3 for 16 hours.
- C. 110,000 gallons ; maintain the unit in MODE 3 for 8 hours.
- D. 110,000 gallons ; maintain the unit in MODE 3 for 16 hours.

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94. Operators are performing 1-ES-1.1, SI Termination, and are preparing to isolate the BIT.

The OATC is not able to open 1-CH-MOV-1373, Charging Pump Recirc Header Isolation Valve.

Based on these plant conditions, which ONE of the following identifies the **sequence of actions** required in accordance with 1-ES-1.1?

- A. Establish normal charging and maintain **25 gpm** charging flow using 1-CH-FCV-1122 in MANUAL, then isolate the BIT.
- B. Establish normal charging and maintain **60 gpm** charging flow using 1-CH-FCV-1122 in MANUAL, then isolate the BIT.
- C. Isolate the BIT, then establish normal charging and maintain **25 gpm** charging flow using 1-CH-FCV-1122 in MANUAL.
- D. Isolate the BIT, then establish normal charging and maintain **60 gpm** charging flow using 1-CH-FCV-1122 in MANUAL.

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95. In accordance with OP-AA-102, Operability Determination, the _____ is responsible for approving prompt Operability Determinations (ODs).

- A. Shift Manager
- B. Operations Manager
- C. Engineering Manager
- D. Licensing Manager

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96. An activity has been proposed that constitutes a test not described in the UFSAR. Additionally, performance of the activity conflicts with the requirements of the Technical Specifications.

Which ONE of the following identifies the requirements to conduct the activity?

- A. The activity will NOT require a 10 CFR 50.59 Evaluation; prior approval from the NRC is NOT required.
- B. The activity will NOT require a 10 CFR 50.59 Evaluation; prior approval from the NRC is required.
- C. The activity will require a 10 CFR 50.59 Evaluation; prior approval from the NRC is NOT required.
- D. The activity will require a 10 CFR 50.59 Evaluation; prior approval from the NRC is required.

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97. Given the following conditions:

- A General Emergency has been declared and an off-site release is in progress
- All Emergency Response Organization facilities are manned and operational
- The TSC has determined that the release point can be isolated by sending an operator into the Auxiliary Building to isolate the flowpath

Which ONE of the following identifies the exposure limit for this activity per EPIP-4.04, Emergency Exposure Limits, and the person (by title) who has the FINAL approval for authorizing emergency exposure limits?

- A. 5 rem ; Station Emergency Manager.
- B. 10 rem ; Station Emergency Manager.
- C. 5 rem ; Radiological Assessment Director.
- D. 10 rem ; Radiological Assessment Director.

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98. Both Units are at 100% power.

A report is received from the FAA that credible insider information has identified that an air threat exists from a Boeing 747 inbound from Miami, Florida with an estimated time of arrival at the station of 30 minutes.

Which ONE of the following identifies the **agency that is contacted** to confirm the threat, and **the action required** by 0-AP-9.01, Station Security Air Threat Operations Response, once the threat is verified to be authentic?

- A. Department of Homeland Security (DHS);
maintain both units stable; shutdown the units only if the threat becomes imminent.
- B. Nuclear Regulatory Commission (NRC);
maintain both units stable; shutdown the units only if the threat becomes imminent.
- C. Department of Homeland Security (DHS);
commence a rapid shutdown of both units using AP-2.2, Fast Load Reduction.
- D. Nuclear Regulatory Commission (NRC);
commence a rapid shutdown of both units using AP-2.2, Fast Load Reduction.

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99. Which ONE of the following describes a **condition required to be reported** to the NRC under 10CFR50.72, and the **correct time limit** for reporting?

- A. Deviation from the plant Technical Specifications authorized pursuant to 10CFR50.54(x); report within 1 hour.
- B. Condition that could have prevented fulfillment of a safety function needed to mitigate consequences of an accident; report within 1 hour.
- C. Failure to perform required surveillance test within technical specification allowable time limits; report within 4 hours.
- D. The nuclear power plant in an unanalyzed condition that significantly degrades plant safety; report within 4 hours.

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100. Given the following conditions:

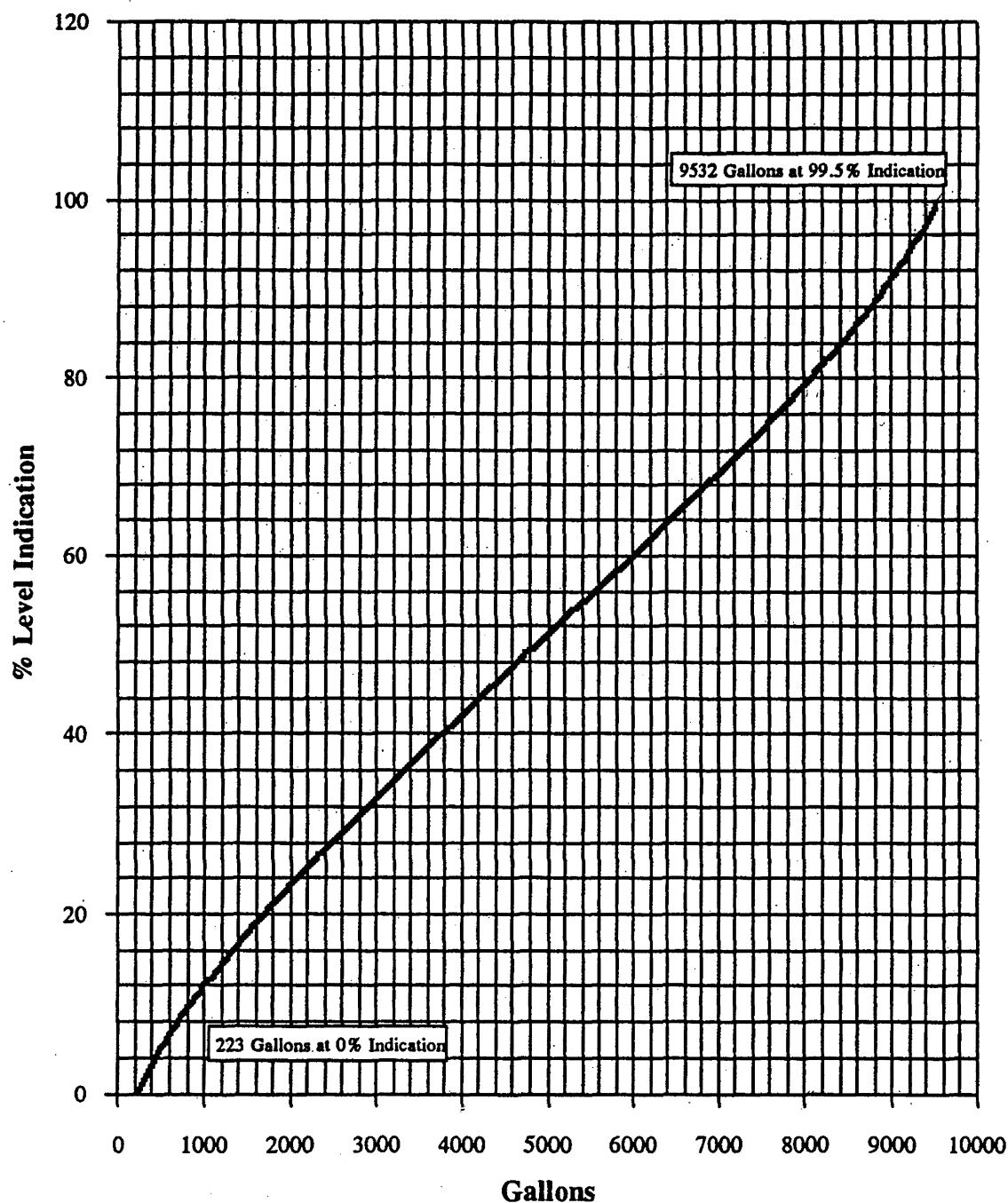
- Unit 1 was at 100% power
- The reactor tripped due to a loss of offsite power
- A loss of all SG feedwater occurred, and operators transitioned from 1-E-0, Reactor Trip or Safety Injection to 1-FR-H.1, Response to Loss of Secondary Heat Sink
- Operators could not restore a source of feedwater, and are establishing RCS bleed and feed in accordance with 1-FR-H.1

Operators were able to open ONLY ONE PRZR PORV.

Based on these plant conditions, the RCS bleed path is _____, and the crew should _____.

- A. adequate;
 depressurize SGs to less than 610 psig while continuing efforts to re-establish a high pressure source to feed SGs.
- B. adequate;
 open Reactor and PRZR vents and align a low-pressure water source to feed SGs.
- C. inadequate;
 depressurize SGs to less than 610 psig while continuing efforts to re-establish a high pressure source to feed SGs.
- D. inadequate;
 open Reactor and PRZR vents and align a low-pressure water source to feed SGs.

**Pressurizer Relief Tank 1-RC-TK-2 Volume Versus
Indicated Level**



APPROVED BY:

JES
CHAIRMAN, STATION NUCLEAR SAFETY
AND OPERATING COMMITTEE

DATE: 5/22/92

PRESSURIZER RELIEF TANK 1-RC-TK-2 VOLUME VERSUS INDICATED LEVEL

NOTE:

- Level transmitter reference leg calibration temperature is 70°F with density 62.305 lbm/ft³.
- Actual tank water temperature is 85°F with a density of 62.172 lbm/ft³.
- The transmitter will no longer increase with increasing level after 99.5 percent indication.

INDICATED LEVEL (%)	EQUIVALENT 110°F VOLUME (GALLONS)
0.0	223.19
0.5	247.91
1.0	273.50
1.5	299.93
2.0	327.17
2.5	355.20
3.0	383.99
3.5	413.51
4.0	443.76
4.5	474.71
5.0	506.34
5.5	538.64
6.0	571.58
6.5	605.16
7.0	639.36
7.5	674.17
8.0	709.56
8.5	745.53
9.0	782.06
9.5	819.15
10.0	856.78
10.5	894.93
11.0	933.60
11.5	972.78
12.0	1012.45

APPROVED BY:


CHAIRMAN, STATION NUCLEAR SAFETY
AND OPERATING COMMITTEE

DATE: 5/22/92

PRESSURIZER RELIEF TANK 1-RC-TK-2 VOLUME VERSUS INDICATED LEVEL

<u>INDICATED LEVEL (%)</u>	<u>EQUIVALENT 110°F VOLUME (GALLONS)</u>
12.5	1052.61
13.0	1093.25
13.5	1134.35
14.0	1175.91
14.5	1217.91
15.0	1260.35
15.5	1303.22
16.0	1346.51
16.5	1390.22
17.0	1434.32
17.5	1478.82
18.0	1523.71
18.5	1568.98
19.0	1614.61
19.5	1660.62
20.0	1706.97
20.5	1753.68
21.0	1800.72
21.5	1848.11
22.0	1895.81
22.5	1943.84
23.0	1992.18
23.5	2040.82
24.0	2089.77
24.5	2139.00
25.0	2188.53
25.5	2238.33
26.0	2288.40
26.5	2338.74
27.0	2389.34
27.5	2440.20
28.0	2491.30
28.5	2542.64
29.0	2594.22
29.5	2646.02

PRESSURIZER RELIEF TANK 1-RC-TK-2 VOLUME VERSUS INDICATED LEVEL

<u>INDICATED LEVEL (%)</u>	<u>EQUIVALENT 110°F VOLUME (GALLONS)</u>
30.0	2698.05
30.5	2750.30
31.0	2802.75
31.5	2855.42
32.0	2908.28
32.5	2961.33
33.0	3014.57
33.5	3068.00
34.0	3121.60
34.5	3175.37
35.0	3229.30
35.5	3283.40
36.0	3337.64
36.5	3392.04
37.0	3446.58
37.5	3501.25
38.0	3556.06
38.5	3610.99
39.0	3666.04
39.5	3721.21
40.0	3776.49
40.5	3831.87
41.0	3887.35
41.5	3942.92
42.0	3998.58
42.5	4054.33
43.0	4110.15
43.5	4166.05
44.0	4222.00
44.5	4278.03
45.0	4334.11
45.5	4390.24
46.0	4446.41
46.5	4502.63
47.0	4558.89

PRESSURIZER RELIEF TANK 1-RC-TK-2 VOLUME VERSUS INDICATED LEVEL

<u>INDICATED LEVEL (%)</u>	<u>EQUIVALENT 110°F VOLUME (GALLONS)</u>
47.5	4615.17
48.0	4671.48
48.5	4727.80
49.0	4784.15
49.5	4840.50
50.0	4896.85
50.5	4953.20
51.0	5009.55
51.5	5065.89
52.0	5122.21
52.5	5178.51
53.0	5234.78
53.5	5291.02
54.0	5347.22
54.5	5403.37
55.0	5459.49
55.5	5515.54
56.0	5571.54
56.5	5627.48
57.0	5683.33
57.5	5739.13
58.0	5794.84
58.5	5850.46
59.0	5906.00
59.5	5961.43
60.0	6016.78
60.5	6072.00
61.0	6127.12
61.5	6182.13
62.0	6237.00
62.5	6291.76
63.0	6346.37
63.5	6400.85
64.0	6455.18
64.5	6509.36

PRESSURIZER RELIEF TANK 1-RC-TK-2 VOLUME VERSUS INDICATED LEVEL

<u>INDICATED LEVEL (%)</u>	<u>EQUIVALENT 110°F VOLUME (GALLONS)</u>
65.0	6563.39
65.5	6617.26
66.0	6670.95
66.5	6724.48
67.0	6777.82
67.5	6830.99
68.0	6883.96
68.5	6936.74
69.0	6989.31
69.5	7041.68
70.0	7093.83
70.5	7145.77
71.0	7197.48
71.5	7248.96
72.0	7300.20
72.5	7351.19
73.0	7401.94
73.5	7452.43
74.0	7502.66
74.5	7552.62
75.0	7602.30
75.5	7651.70
76.0	7700.82
76.5	7749.63
77.0	7798.15
77.5	7846.36
78.0	7894.25
78.5	7941.81
79.0	7989.05
79.5	8035.95
80.0	8082.51
80.5	8128.71
81.0	8174.56
81.5	8220.05
82.0	8265.15

PRESSURIZER RELIEF TANK 1-RC-TK-2 VOLUME VERSUS INDICATED LEVEL

<u>INDICATED LEVEL (%)</u>	<u>EQUIVALENT 110°F VOLUME (GALLONS)</u>
82.5	8309.87
83.0	8354.21
83.5	8398.14
84.0	8441.66
84.5	8484.78
85.0	8527.47
85.5	8569.72
86.0	8611.55
86.5	8652.90
87.0	8693.80
87.5	8734.24
88.0	8774.20
88.5	8813.66
89.0	8852.62
89.5	8891.07
90.0	8929.00
90.5	8966.40
91.0	9003.26
91.5	9039.55
92.0	9075.27
92.5	9110.42
93.0	9144.96
93.5	9178.90
94.0	9212.21
94.5	9244.88
95.0	9276.90
95.5	9308.24
96.0	9338.89
96.5	9368.84
97.0	9398.05
97.5	9426.52
98.0	9454.21
98.5	9481.11
99.0	9507.18
99.5	9532.40

3.7.1 Main Steam Safety Valves (MSSVs)

LC0 3.7.1 Five MSSVs per steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- - - - - NOTE - - - - -
Separate Condition entry is allowed for each MSSV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more steam generators with one MSSV inoperable and the Moderator Temperature Coefficient (MTC) zero or negative at all power levels.	A.1 Reduce THERMAL POWER to less than or equal to 52% RTP.	4 hours
B. One or more steam generators with one MSSV inoperable and the MTC positive at any power levels. OR One or more steam generators with two or more MSSVs inoperable.	B.1 Reduce THERMAL POWER to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs. AND	4 hours (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	<p>B.2 -----NOTE----- Only required in MODE 1. -----</p> <p>Reduce the Power Range Neutron Flux-High reactor trip setpoint to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.</p>	36 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
<u>OR</u>	<u>AND</u>	
One or more steam generators with greater than or equal to 4 MSSVs inoperable.	C.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.7.1.1 -----NOTE----- Only required to be performed in MODES 1 and 2. -----</p> <p>Verify each required MSSV lift setpoint per Table 3.7.1-2 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within $\pm 1\%$.</p>	In accordance with the Inservice Testing Program

Table 3.7.1-1 (page 1 of 1)
OPERABLE Main Steam Safety Valves versus
Maximum Allowable Power

NUMBER OF OPERABLE MSSVs PER STEAM GENERATOR	MAXIMUM ALLOWABLE POWER % RTP
4	52
3	37
2	21

Table 3.7.1-2 (page 1 of 1)
Main Steam Safety Valve Lift Settings

<u>STEAM GENERATOR</u>			LIFT SETTING (psig ± 3%)
#1	#2	#3	
Unit 1 VALVE NUMBER			
MS-SV-101A	MS-SV-101B	MS-SV-101C	1085
MS-SV-102A	MS-SV-102B	MS-SV-102C	1095
MS-SV-103A	MS-SV-103B	MS-SV-103C	1110
MS-SV-104A	MS-SV-104B	MS-SV-104C	1120
MS-SV-105A	MS-SV-105B	MS-SV-105C	1135
Unit 2 VALVE NUMBER			
MS-SV-201A	MS-SV-201B	MS-SV-201C	1085
MS-SV-202A	MS-SV-202B	MS-SV-202C	1095
MS-SV-203A	MS-SV-203B	MS-SV-203C	1110
MS-SV-204A	MS-SV-204B	MS-SV-204C	1120
MS-SV-205A	MS-SV-205B	MS-SV-205C	1135

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources—Operating

- LC0 3.8.1 The following AC electrical sources shall be OPERABLE:
- a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System;
 - b. Two emergency diesel generators (EDGs) capable of supplying the onsite Class 1E power distribution subsystem(s);
 - c. One qualified circuit between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System and one EDG capable of supplying the onsite Class 1E AC power distribution subsystem on the other unit for each required shared component; and
 - d. Required sequencing timing relays.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LC0 3.8.1.a offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for required OPERABLE offsite circuit(s).	1 hour
	<u>AND</u>	<u>AND</u> Once per 8 hours thereafter (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	<u>AND</u> A.3 Restore offsite circuit to OPERABLE status.	72 hours <u>AND</u> 17 days from discovery of failure to meet LCO
B. One LCO 3.8.1.b EDG inoperable.	B.1 Perform SR 3.8.1.1 for the required offsite circuits.	1 hour <u>AND</u> Once per 8 hours thereafter
	<u>AND</u> B.2 Declare required feature(s) supported by the inoperable EDG inoperable when its required redundant feature(s) is inoperable. <u>AND</u>	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s) (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3.1 Determine OPERABLE LCO 3.8.1.b EDG is not inoperable due to common cause failure.	24 hours
	<u>OR</u>	
	B.3.2 Perform SR 3.8.1.2 for OPERABLE LCO 3.8.1.b EDG.	24 hours
	<u>AND</u>	
	B.4 Restore EDG to OPERABLE status.	14 days
		<u>AND</u>
		17 days from discovery of failure to meet LCO
C. -----NOTE----- Only applicable if Alternate AC (AAC) diesel generator (DG) or one or more EDG on the other unit is inoperable. ----- One LCO 3.8.1.b EDG inoperable.	C.1.1 Restore inoperable AAC DG to OPERABLE status.	72 hours
	<u>AND</u>	
	C.1.2 Restore inoperable EDG(s) on other unit to OPERABLE status.	72 hours
	<u>OR</u>	
	C.2 Restore EDG to OPERABLE status.	72 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One required LCO 3.8.1.c EDG inoperable.	E.1 Perform SR 3.8.1.1 for required offsite circuit(s).	1 hour <u>AND</u> Once per 8 hours thereafter
	<u>AND</u> E.2 Declare required feature(s) supported by the inoperable EDG inoperable when its redundant required feature(s) is inoperable.	4 hours from discovery of Condition E concurrent with inoperability of redundant required feature(s)
	<u>AND</u> E.3 Declare associated shared component inoperable.	14 days
F. -----NOTE----- Only applicable if one or more LCO 3.8.1.b EDG(s) or AAC DG is inoperable. ----- One required LCO 3.8.1.c EDG inoperable.	F.1.1 Restore inoperable AAC DG to OPERABLE status.	72 hours
	<u>AND</u> F.1.2 Restore inoperable LCO 3.8.1.b EDG (s) to OPERABLE status.	72 hours
	<u>OR</u> F.2 Declare associated shared component inoperable.	72 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Two LCO 3.8.1.a offsite circuits inoperable.	G.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition G concurrent with inoperability of redundant required features
	<u>AND</u> G.2 Restore one offsite circuit to OPERABLE status.	24 hours
H. One LCO 3.8.1.a offsite circuit inoperable. <u>AND</u> One LCO 3.8.1.b EDG inoperable.	-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems—Operating," when Condition H is entered with no AC power source to any train. -----	
	H.1 Restore offsite circuit to OPERABLE status.	12 hours
	<u>OR</u> H.2 Restore EDG to OPERABLE status.	12 hours
I. Two LCO 3.8.1.b EDGs inoperable.	I.1 Restore one EDG to OPERABLE status.	2 hours
J. Two required LCO 3.8.1.c EDGs inoperable.	J.1 Declare associated shared components inoperable.	Immediately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>K. -----NOTE----- Separate Condition entry is allowed for each sequencing timing relay. ----- One or more required sequencing timing relay(s) inoperable.</p>	<p>K.1 Enter appropriate Conditions and Required Actions for any component made inoperable by inoperable sequencing timing relay(s).</p>	Immediately
	<p><u>AND</u></p> <p>K.2.1 Place the component(s) with the inoperable sequencing timing relay in a condition where it cannot be automatically loaded to associated emergency electrical bus.</p>	Immediately
	<p><u>OR</u></p> <p>K.2.2 Declare the associated EDG inoperable.</p>	Immediately
<p>L. Required Action and associated Completion Time of Condition A, B, C, G, H, or I not met.</p>	<p>L.1 Be in MODE 3.</p>	6 hours
	<p><u>AND</u></p> <p>L.2 Be in MODE 5.</p>	36 hours
<p>M. Three or more of LCO 3.8.1.a and LCO 3.8.1.b AC sources inoperable.</p>	<p>M.1 Enter LCO 3.0.3.</p>	Immediately

ANSWER KEY REPORT
NAPS 2009 NRC ~~RO~~ Re-Take Exam

~~doc 3/21/09~~
SRO

Answers

#	Points	0
1	1.00	D
2	1.00	C
3	1.00	B
4	1.00	B
5	1.00	D
6	1.00	D
7	1.00	D
8	1.00	A
9	1.00	C
10	1.00	B
11	1.00	A
12	1.00	A
13	1.00	C
14	1.00	D
15	1.00	A
16	1.00	C
17	1.00	C
18	1.00	A
19	1.00	A
20	1.00	D
21	1.00	A
22	1.00	D
23	1.00	A
24	1.00	A
25	1.00	A
26	1.00	B
27	1.00	A
28	1.00	D
29	1.00	B
30	1.00	A
31	1.00	A
32	1.00	C
33	1.00	A
34	1.00	A
35	1.00	A
36	1.00	D
37	1.00	A
38	1.00	C
39	1.00	B
40	1.00	B
41	1.00	C
42	1.00	C
43	1.00	A
44	1.00	A
45	1.00	A
46	1.00	A
47	1.00	B
48	1.00	B

ANSWER KEY REPORT
NAPS 2009 NRC RO Re-Take Exam

SRO ^{in 3/11/09} Answers		
#	Points	0
49	1.00	A
50	1.00	D
51	1.00	A
52	1.00	A
53	1.00	A
54	1.00	C
55	1.00	A
56	1.00	D
57	1.00	C
58	1.00	D
59	1.00	A
60	1.00	A
61	1.00	C
62	1.00	A
63	1.00	C
64	1.00	A
65	1.00	B
66	1.00	D
67	1.00	B
68	1.00	A
69	1.00	D
70	1.00	D
71	1.00	D
72	1.00	D
73	1.00	A
74	1.00	A
75	1.00	A

ANSWER KEY REPORT
NAPS 2009 NRC SRO Re-Take Exam

Answers

#	Points	0
76	1.00	D
77	1.00	D
78	1.00	D
79	1.00	A
80	1.00	C
81	1.00	D
82	1.00	A
83	1.00	D
84	1.00	C
85	1.00	A
86	1.00	D
87	1.00	C
88	1.00	C
89	1.00	A
90	1.00	A
91	1.00	D
92	1.00	D
93	1.00	C
94	1.00	B
95	1.00	A
96	1.00	D
97	1.00	B
98	1.00	D
99	1.00	A
100	1.00	D