

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

Name:

Date: September 5, 2013

Facility/Unit: V.C. Summer Unit 1

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 _____ / _____ / _____ Points

Applicant's Scores _____ / _____ / _____ Points

Applicant's Grade _____ / _____ / _____ Percent

1. Given the following plant conditions:

- Loss of offsite power (115KV and 230 KV) occurred.
- Steam Generator Tube Rupture occurred.
- EOP-4.0, STEAM GENERATOR TUBE RUPTURE, in progress.
- Both Charging pumps are in injection mode.
- RCS cooldown complete.
- RCS depressurization is in progress.
- Pressurizer level is 50%, rising rapidly.
- RCS pressure is 750 psig, lowering.
- Ruptured SG pressure is 650 psig, stable.
- RCS temperature is 430°F, stable.

Which ONE (1) of the following describes a valid reason for the rapidly increasing pressurizer level and a required action in accordance with EOP-4.0?

- A. Accumulators are injecting; Stop the depressurization immediately.
- B. Accumulators are injecting; Continue the depressurization to lower RCS pressure to less than the ruptured S/G pressure.
- C. The Reactor Vessel head is voiding; Stop the depressurization immediately.
- D. The Reactor Vessel Head is voiding; Continue the depressurization to lower RCS pressure to less than the ruptured S/G pressure.

2. Given the following plant conditions:

Time 10:00:

- 100% power.
- "B" CCW Train is aligned as the active loop.

Time 10:30:

- Reactor trip.

Time 10:35:

- Lockout occurs on XTF-32.
- No EDGs start.

Which of the following describes the status of Reactor Coolant Pump(s) and whether there is CCW cooling flow to Reactor Coolant Pump (RCP) bearing oil coolers?

Assume no operator actions

- A. **All** RCPs are running; CCW flow is supplied to RCP bearing oil coolers.
- B. **All** RCPs are running; CCW flow is **not** supplied to RCP bearing oil coolers.
- C. **Only** "C" RCP is running; CCW flow is supplied to RCP bearing oil coolers.
- D. **Only** "C" RCP is running; CCW flow is **not** supplied to RCP bearing oil coolers.

3. Given the following plant conditions:

- IAI11005-WG, WG RECOMBINER A&B SYSTEM INLET OXY ANLZR readings were as follows:

Time 1100	4.1%
Time 1110	2.2%
Time 1120	2.4%
Time 1130	4.4%

- HARC-1104A(B), HYDROGEN IN readings were as follows.

Time 1100	2.4%
Time 1110	2.5%
Time 1120	4.2%
Time 1130	4.3%

Which ONE of the following identifies the earliest time that a ONE (1) hour action statement was entered to reduce oxygen concentration in the Waste Gas System in accordance with T.S. 3.11.2 GASEOUS EFFLUENTS - EXPLOSIVE GAS MIXTURE?

- A. 1100
- B. 1110
- C. 1120
- D. 1130

4. Given the following plant conditions:

- The plant is in Mode 5.
- RCS temperature is 150°F.
- RCS pressure is 350 psig.
- "A" RHR Train is aligned for shutdown cooling.
- Low pressure letdown is in service.
- PCV-145, LO PRESS LTDN is in AUTO, set at 350 psig.

Which ONE of the following describes an event that will cause both PCV-145 to **initially** throttle closed and RCS pressure to **initially** increase upon initiation of the event?

- A. Tripping the in-service RHR Pump
- B. Throttling FCV-122, CHG FLOW from 100% open to 50% open.
- C. Increasing CCW flow through an in-service RHR heat exchanger.
- D. Throttling HCV-142, LTDN FROM RHR from 50% open to 100% open.

5. Given the following plant conditions:

Initial Conditions:

- 100% power.
- A Large Break LOCA occurs.
- "A" Train of SI actuated.
- "B" Train of SI **failed** to actuate automatically or manually.
- EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION, Attachment 3 is complete.

Current Condition:

- XCP-612, 4-3, RWST LVL LO-LO XFER TO SUMP is illuminated

Which ONE (1) of the following describes the setpoint of XCP-612, 4-3 and the suction source(s) that will supply the RHR pumps five (5) minutes after XCP-612, 4-3 alarms?

Assume no additional operator actions.

- A. Setpoint is 10%; "A" and "B" RHR pump suctions will **both** be supplied by the RB Recirculation sump.
- B. Setpoint is 18%; "A" and "B" RHR pump suctions will **both** be supplied by the RB Recirculation sump.
- C. Setpoint is 10%; "A" RHR pump suction will be supplied by the RB Recirculation Sump and "B" RHR pump suction will be supplied by the RWST.
- D. Setpoint is 18%; "A" RHR pump suction will be supplied by the RB Recirculation Sump and "B" RHR pump suction will be supplied by the RWST.

6. Given the following plant conditions:

- 100% Power.
- LOCA in progress.
- 51BX Lockout on Bus 1DB occurred.
- EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT in progress.

Select ONE of the choices below that completes the following statements:

Accumulator Discharge Isolation Valves MVG-8808A(B)(C) are normally
____(1)_____ at power;

Power to MVG-8808C ____ (2) _____ available if isolation of Accumulators is required.

- | (1) | (2) |
|----------------|----------------------|
| A. Energized | is |
| B. Energized | is <u>not</u> |
| C. Deenergized | is |
| D. Deenergized | is <u>not</u> |

7. Given the following plant conditions:

- 100% Power.
- Reactor trip occurs.
- Immediate actions of EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION are in progress.
- Two (2) control rods are stuck at 220 steps.
- ALL other control rods indicate 0 steps.
- T_{AVG} 557°F and stable.

Select ONE of the choices below that completes the following statements:

One minute after the trip, shutdown margin is increasing due to the decay of ____ (1) ____ ;

Operators will be required to borate ____ (2) ____ gallons as directed by EOP-1.1, REACTOR TRIP RECOVERY.

	(1)	(2)
A.	Iodine	2500
B.	Iodine	5800
C.	Xenon	2500
D.	Xenon	5800

8. Given the following plant conditions:

- 100% power.
- XCP-616, 4-4, PRT LVL LO/TEMP/LVL/PRESS HI.
- PRT conditions are as follows:

Temperature	115°F.
Level	66%.
Pressure	7 psig.

Which ONE of the following describes the parameter causing the alarm and the method that can be used to clear the alarm?

A. Temperature is high;

Cool the PRT with the RCDT heat exchanger using Component Cooling Water to cool the heat exchanger.

B. Temperature is high;

Cool the PRT with the RCDT heat exchanger using Service Water to cool the heat exchanger.

C. Pressure is high;

Drain the PRT to the Recycle Holdup tank.

D. Pressure is high;

Vent the PRT to the Waste Gas System.

9. Given the following plant conditions:

Initial Condition:

- PZR Pressure Transmitter PT-455 failed high.

Current Condition:

- PZR Pressure Transmitter PT-444 failed high.

Select ONE of the choices below that completes the following statement:

PORV(s) ____ (1) ____ will open, and the valve(s) ____ (2) ____ be closed at an actual pressurizer pressure of 1950 psig.

Assume no operator actions.

- | | (1) | (2) |
|----|-----------------------------|------------------------|
| A. | PCV-444B <u>only</u> | will |
| B. | PCV-444B <u>only</u> | will <u>not</u> |
| C. | PCV-445B and PCV-444B | will |
| D. | PCV-445B and PCV-444B | will <u>not</u> |

10. Given the following plant conditions:

- 35% power.
- A loss of Component Cooling Water has occurred.
- "A" RCP motor bearing temperature is 189°F and increasing slowly.
- "A" RCP lower seal water bearing temperature is 226°F and increasing slowly.
- The crew is taking actions as directed by AOP-118.1, TOTAL LOSS OF COMPONENT COOLING WATER.

Which ONE of the following identifies the parameter that has exceeded an operating limit and describes whether an immediate Reactor trip will be required in accordance with AOP-118.1?

A. RCP Motor Bearing temperature;

Reactor trip required.

B. RCP Lower Seal Water Bearing temperature;

Reactor trip required.

C. RCP Motor Bearing temperature;

Reactor trip **not** required.

D. RCP Lower Seal Water bearing temperature;

Reactor trip **not** required.

11. Given the following plant conditions:

Time 1700:

- Mode 4.
- RHR Train "B" running in the shutdown cooling mode.
- "A" CCW loop is active.
- "A" CCW pump discharge pressure is 30 psig.
- XCP-601, 1-2, CCP A/C AUTOSTART FAIL in alarm.
- "A" Charging pump in service.
- Component temperatures are being monitored in the Control Room **only**.

Time **now** - 1720

Which ONE of the choices below completes the following?:

_____ (1) _____ must be stopped to prevent damage to the _____ (2) _____.

(1)

(2)

- | | | |
|----|-------------------|-------------------------------|
| A. | "A" Charging pump | Charging pump motor bearing. |
| B. | "A" Charging pump | Charging pump thrust bearing. |
| C. | "B" RHR pump | RHR pump bearing. |
| D. | "B" RHR pump | RHR pump seals. |

12. Given the following plant conditions:

Time 1300:

- Small break LOCA has occurred.
- Cooldown in progress as directed in EOP-2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION.

Time 1310:

- "A" Charging pump has been stopped in accordance with EOP-2.1.

Time 1320:

- "B" Charging pump is running in injection mode.
- Pressurizer level 37%.
- RCS WR pressure 885 psig.
- RCS T_{COLD} 464°F.
- RCS T_{HOT} 474°F.
- Core Exit TCs 482°F.
- RB pressure 3 psig.

Which ONE of the following describes the current value of RCS subcooling on TI-499A/499B, A(B) TEMP °F and the required action, if any, regarding the "A" Charging Pump in accordance with EOP-2.1?

- A. 50°F; Start "A" Charging Pump.
- B. 50°F; No action required.
- C. 58°F; Start "A" Charging Pump.
- D. 58°F; No action required.

13. Given the following plant conditions:

- 100% Power.
- Plant fire reported.
- Reactor Trip initiated.
- The crew has entered FEP-2.1, TRAIN A SHUTDOWN FROM HOT STANDBY TO COLD SHUTDOWN DUE TO A FIRE.
- All **Balance of Plant Busses** are de-energized.

Which ONE of the following describes **all** Pressurizer heaters that are available to raise RCS pressure during the cooldown to Mode 4?

- A. Group 1 Backup Heaters, ONLY.
- B. Control Group **and** Group 1 Backup Heaters ONLY.
- C. Group 1 Backup Heaters **and** Group 2 Backup Heaters, ONLY.
- D. Control Group **and** Group 1 Backup Heaters **and** Group 2 Backup Heaters.

14. Given the following plant conditions:

- Large break LOCA occurred at 0100.
- Cold Leg Recirculation initiated at 0200.
- Time is now 0945.

Which ONE of the following identifies the correct positions for the listed valves at the current time?

- | | |
|-----------------------------------|--------|
| A. MVG-8884, CHG LP A TO HOT LEGS | CLOSED |
| MVG-8886, CHG LP B TO HOT LEGS | CLOSED |
| MVG-8889, RHR LP A&B TO HOT LEGS | CLOSED |
| B. MVG-8884, CHG LP A TO HOT LEGS | CLOSED |
| MVG-8886, CHG LP B TO HOT LEGS | CLOSED |
| MVG-8889, RHR LP A&B TO HOT LEGS | OPEN |
| C. MVG-8884, CHG LP A TO HOT LEGS | OPEN |
| MVG-8886, CHG LP B TO HOT LEGS | OPEN |
| MVG-8889, RHR LP A&B TO HOT LEGS | CLOSED |
| D. MVG-8884, CHG LP A TO HOT LEGS | OPEN |
| MVG-8886, CHG LP B TO HOT LEGS | OPEN |
| MVG-8889, RHR LP A&B TO HOT LEGS | OPEN |

15. Given the following plant condition:

- 100% power.
- All rods at 230 steps.

Which ONE of the choices below describes the effect of the following events on the OTΔT trip setpoints after 30 minutes?

- 1) NI-44 Lower detector fails low.
- 2) PZR PRESS MASTER CONTROL setpoint drifts low.

ASSUME EACH EVENT OCCURS SEPARATELY AND THAT THE REACTOR DOES NOT TRIP.

	(1)	(2)
A.	Remains the same.	Decreases.
B.	Remains the same.	Increases.
C.	Decreases.	Decreases.
D.	Decreases.	Increases.

16. Given the following plant conditions:

- 100% power.
- Flow in the RCS loop "A" drops to 75%.

Which ONE of the following permissive bistables, if in the wrong condition for current plant status, would **prevent** an automatic reactor trip and the normal setpoint for the this bistable?

- A. P-7; 10% power.
- B. P-8 10% power.
- C. P-7; 38% power.
- D. P-8; 38% power.

17. Given the following plant conditions:

- Initially 100% power.
- A double-ended shear of the "A" RCS Cold Leg occurred at 7:00.
- All equipment worked as designed.
- It is now 7:40.

Which ONE of the following contains the **largest** list of alignments that will have occurred **automatically** for the given conditions, if any?

Assume no operator actions.

- A. **No** automatic alignments have occurred.
- B. MVG-8811A(B), RHR SUMP A(B) TO RHR PP A(B) OPENED
MVG-8809A(B), RWST TO PP A(B) CLOSED
- C. MVG-8811A(B), RHR SUMP A(B) TO RHR PP A(B) OPENED
MVG-8812A(B), RHR SUMP A(B) TO RHR PP A(B) OPENED
- D. MVG-8811A(B), RHR SUMP A(B) TO RHR PP A(B) OPENED
MVG-8812A(B), RHR SUMP A(B) TO RHR PP A(B) OPENED
MVG-8809A(B), RWST TO PP A(B) CLOSED

18. Given the following plant conditions:

- 100% power.
- IPT-950, Reactor Building Pressure Channel I, has failed HIGH.
- Containment Pressure HI-3 bistable PB-950 has been placed in BYPASS.

Which ONE of the following identifies how many of the **remaining** channels must measure high pressure to initiate a HI-1 and a HI-3 RB Pressure actuation signal?

Assume no additional operator actions.

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

19. Given the following plant conditions:

- 80% power.
- Plant startup is in progress.
- Rods are in MANUAL.
- Indication for Rod K-10 in Control Bank "D", Group 2 is at 174 steps and does not move with the rest of the associated group.
- The Control Bank "D" Group 2 demand counter indicates 188 steps.

Which ONE of the following identifies the procedure that will be entered and a method that is allowed to be used **first** to maintain Tavg **after immediate actions are complete**.

- A. Enter AOP-403.4, FAILURE OF CONTROL RODS TO MOVE.
Adjust turbine load.
- B. Enter AOP-403.4, FAILURE OF CONTROL RODS TO MOVE.
Move control rods in manual.
- C. Enter AOP-403.5, STUCK OR MISALIGNED CONTROL RODS.
Adjust turbine load.
- D. Enter AOP-403.5, STUCK OR MISALIGNED CONTROL RODS.
Move control rods in manual.

20. Given the following plant conditions:

- 9% Reactor power.
- Bus 1A/1B/1C frequency 55.0 hz.
- Bus 1A/1B/1C voltage 5400 VAC.
- RCP breakers **open**.

Which ONE of the choices below answer both of the following?:

- 1) What is the purpose of the automatic function that opened the RCP breakers?
- 2) Should the Reactor have also tripped for the above conditions?

- A. 1) To preserve RCP flywheel kinetic energy.
2) The Reactor should have tripped.
- B. 1) To preserve RCP flywheel kinetic energy.
2) The Reactor should **not** have tripped.
- C. 1) To ensure that motor windings do not overheat.
2) The Reactor should have tripped.
- D. 1) To ensure that motor windings do not overheat.
2) The Reactor should **not** have tripped.

21. Given the following plant conditions:

- 70% power.
- "A" S/G level 61%, stable.
- Channel III steam flow and feed flow detectors are selected as controlling.

Which ONE of the following individual detector failures will cause "A" S/G water level to **increase** if NO operator action is taken?

- A. Main steam header pressure detector PT-464 fails LOW.
- B. LI-474, SG A NR LEVEL % (CH I) fails LOW.
- C. "A" S/G steam pressure detector PT-475 (Channel III) fails HIGH.
- D. Feedwater pump discharge header pressure detector PT-508 fails HIGH.

22. Given the following plant conditions:

- Mode 1
- The following RB temperatures are noted on station logs:
 - RB 412' Average - 116°F
 - RB 436' Average - 119°F
 - RB 463' Average - 124°F
- XFN-64B/XFN 65B - RBCU TRAIN B EMERG is selected to XFN 64B.
- The NROATC took the XFN0065B 2B **NORM (fast speed)** control switch to START for 1 second and released the switch.
- The NROATC noted the following indications:
 - The red running light remained dim.
 - Fan amps remained at 0 amps.

Which ONE of the choices below answers both of the following:

- 1) Is L.C.O. T.S. 3.6.1.5 CONTAINMENT SYSTEMS - AIR TEMPERATURE currently met?
- 2) What action will allow the operator to start Fan XFN-65B in accordance with SOP-114, REACTOR BUILDING VENTILATION SYSTEM?

A. 1) T.S. 3.6.1.5 L.C.O. is met;

- 2) The XFN-64B/XFN 65B - RBCU TRAIN B EMERG must be selected to XFN 65B prior to taking the control switch to START.

B. 1) T.S. 3.6.1.5 L.C.O. is met;

- 2) The XFN0065B 2B NORM switch must be held to START until the red running light is lit and fan amps are indicated.

C. 1) T.S. 3.6.1.5 L.C.O. is **not** met;

- 2) The XFN-64B/XFN 65B - RBCU TRAIN B EMERG must be selected to XFN 65B prior to taking the control switch to START.

D. 1) T.S. 3.6.1.5 L.C.O. is **not** met;

- 2) The XFN0065B 2B NORM switch must be held to START until the red running light is lit and fan amps are indicated.

23. Given the following plant conditions:

- 100% power.
- "A" Charging pump in service.

Which ONE of the following describes the minimum number of misaligned valves that would lead to a loss of Charging pump suction and the first action, or set of actions, that would be performed by AOP-102.2, LOSS OF CHARGING after stopping "A" Charging pump?

- A. Inadvertent closure of MVG-8130A, LP A SUCT TO CHG PP C, only;
Isolate Charging and Letdown.
- B. Inadvertent closure of MVG-8130A, LP A SUCT TO CHG PP C, only;
Start "B" Charging pump.
- C. Inadvertent closure of both MVG-8130A, LP A SUCT TO CHG PP C and
MVG-8130B, LP A SUCT TO CHG PP C.
Isolate Charging and Letdown.
- D. Inadvertent closure of both MVG-8130A, LP A SUCT TO CHG PP C and
MVG-8130B, LP A SUCT TO CHG PP C.
Start "B" Charging pump.

24. Given the following plant conditions:

- Large-break LOCA occurred.
- RWST level 9%.
- RHR Sump level 413 ft.
- MVG-8706A(B), RHR LP A(B) TO CHG PP are closed.
- LCV-115B(D), RWST TO CHG PP SUCT are open.
- EOP-2.2 TRANSFER TO COLD LEG RECIRCULATION in progress.

Which ONE of the choices below answers both of the following?:

1) Can cold leg recirculation be established with the current RHR sump level?

2) What action will be taken under the current conditions?

- A. 1) Yes.
2) Secure one charging pump **only**.
- B. 1) Yes.
2) Stop both Charging pumps.
- C. 1) No.
2) Secure one charging pump **only**.
- D. 1) No.
2) Stop both Charging pumps.

25. Given the following plant conditions:

Time 0400:

- A partial steamline break occurred in the Reactor Building.
- Reactor Building Pressure peaked at 13 psig.

Time 0410:

- Reactor Building Pressure is 5 psig, lowering.
- EOP-1.2, SAFETY INJECTION TERMINATION in progress.
- Operators are checking to determine if RB Spray should be stopped.

Which ONE of the choices below answers both of the following:

- 1) When is the **earliest** time that stopping RB Spray pumps will be allowed by EOP-1.2?
 - 2) What is the **minimum** number of control manipulations that will **satisfy the reset circuit logic** to allow operators to stop RB Spray pumps from the Main Control Board?
- A. 1) Immediately.
2) Depress both RESET TRAIN A(B) RB SPRAY pushbuttons ONLY.
- B. 1) Immediately.
2) Depress both RESET Phase A - TRAIN A(B) CTMT ISOL pushbuttons **then** depress both RESET Phase B - TRAIN A(B) CNTMT ISOL pushbuttons **then** depress both RESET TRAIN A(B) RB SPRAY pushbuttons.
- C. 1) 0800
2) Depress both RESET TRAIN A(B) RB SPRAY pushbuttons ONLY.
- D. 1) 0800
2) Depress both RESET Phase A - TRAIN A(B) CTMT ISOL pushbuttons **then** depress both RESET Phase B - TRAIN A(B) CNTMT ISOL pushbuttons **then** depress both RESET TRAIN A(B) RB SPRAY pushbuttons.

26. Given the following plant conditions:

Time 0800:

- Loss of CCW occurred.
- AOP-118.1, TOTAL LOSS OF COMPONENT COOLING WATER in progress.

Time 0830:

- LOCA occurred.
- RB pressure 13 psig.

Time 900:

- ONE loop of CCW restored.
- Operators are restoring RCP Thermal Barrier flow.

Which ONE of the choices below answers both of the following:

- 1) What is the **lowest** flow rate that will meet the RCP Thermal barrier flow requirement?
- 2) What containment isolation function will prevent reestablishing flow to the RCP Thermal Barriers from the Main Control Board if **not** reset?

- A. 1) 91 gpm.
2) Phase A.
- B. 1) 91 gpm.
2) Phase B.
- C. 1) 401 gpm.
2) Phase A.
- D. 1) 401 gpm.
2) Phase B.

27. Given the following plant conditions:

Initial conditions:

- 100% power initially.
- Spurious Safety Injection occurs.
- ATWS occurred.

Current conditions:

- EOP-13.0, RESPONSE TO ABNORMAL NUCLEAR POWER GENERATION.

Which ONE of the following describes the verification that operators will perform to ensure that adequate boration is occurring in accordance with EOP-13.0?

- A. Operators will verify that a minimum of 30 gpm is indicated on FI-110, EMRG BORATE FLOW GPM.
- B. Operators will verify that any High Head injection flow is indicated on FI-943, CHG LOOP B CLD/ HOT LG FLOW GPM.
- C. Operators will verify that a minimum of 30 gpm is indicated on FI-943, CHG LOOP B CLD/ HOT LG FLOW GPM.
- D. Operators will verify that any flow is indicated on FI-110, EMRG BORATE FLOW GPM.

28. Given the following plant conditions:

- Mode 6.
- Spent Fuel Pool level decreasing.
- RM-G17A(B), RB MANIP CRANE AREA GAMMA, indication rising.
- AOP-123.1, DECREASING LEVEL IN THE SPENT FUEL POOL OR REFUELING CAVITY DURING REFUELING, in progress.

Which ONE of the following identifies the radiation threshold, as read on RM-G17A(B), that is specifically used in AOP-123.1 to trigger immediate evacuations and the areas that are evacuated.

- | | |
|-------------|--|
| A. 2 R/ hr; | Reactor Building <u>only</u> . |
| B. 2 R/hr; | Reactor Building <u>and</u> Fuel Handling Building. |
| C. 20 R/hr; | Reactor Building <u>only</u> . |
| D. 20 R/hr; | Reactor Building <u>and</u> Fuel Handling Building. |

29. Given the following plant conditions:

- Mode 6.
- Fuel handling in progress.
- RB 36" purge is in progress.
- The RM-A2, REACTOR BUILDING VENT gas channel detector has failed high.

Which ONE of the following describes the valves that have closed in response to the malfunction of RM-A2, if any?

- A. No valves have closed.
- B. PVB-1A, CNTMT SPLY ISOL
PVB-2A, CNTMT EXH ISOL
- C. PVB-1B, CNTMT SPLY ISOL
PVB-2B, CNTMT EXH ISOL
- D. PVB-1A, CNTMT SPLY ISOL
PVB-1B, CNTMT SPLY ISOL
PVB-2A, CNTMT EXH ISOL
PVB-2B, CNTMT EXH ISOL

30. Given the following plant conditions:

- 13% power.
- T_{avg} is 564°F, stable.
- Steam dumps are controlling in **automatic** in the STEAM PRESSURE mode.
- The Main Generator is being prepared to parallel to the grid.
- The synchroscope is rotating slowly in the SLOW direction.

Which ONE of the following actions would cause an **initial** "swell" in S/G water level?

- A. Adjusting turbine controls so that the synchroscope rotates in the FAST direction.
- B. Raising the setpoint on the STM DUMP CNTRL potentiometer.
- C. Shifting the STM DUMP MODE SELECT to T_{AVG} MODE.
- D. Inserting control rods 5 steps in MANUAL.

31. Given the following plant conditions:

- Mode 6.
- Core offload was in progress.
- A fuel assembly has been dropped from the Manipulator Crane.
- AOP-123.3, POTENTIAL FUEL ASSEMBLY DAMAGE WHILE HANDLING FUEL, in progress.

Which ONE of the following is the **first** action directed by AOP-123.3, **of those listed**?

- A. Close the Fuel Transfer Tube Valve.
- B. Return the fuel transfer cart to the Fuel Handling Building.
- C. Start one train of Control Room Emergency Ventilation.
- D. Verify either XFN-23A(B), FUEL BLDG EXH FAN A(B), is running.

32. Given the following plant conditions:

Time 1400:

- 40% power.
- AOP-112.2, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI, in progress.
- XCP-645, 1-4 CNDSR EXH RM-A9 TRBL in alarm.
- The RM-A9, CNDSR EXHAUST GAS ATMOS, module has the following indications:
 - Meter reading 0 c/m
 - HI RAD light DIM
 - WARN light DIM
 - FAIL light LIT
 - NOR-CS light DIM

Select the ONE choice below that answers both of the following questions:

- 1) What is causing the indications on the RM-A9 module?
 - 2) What method will be used to determine the time by which the plant must be shutdown?
- A. 1) RM-A9 has lost power.
2) Steam Generator or Blowdown chemistry analysis.
- B. 1) RM-A9 has lost power.
2) Rate of change of RMG-19A(B)(C), STMLN HI RNG GAMMA.
- C. 1) RM-A9 has a detector failure.
2) Steam Generator or Blowdown chemistry analysis.
- D. 1) RM-A9 has a detector failure.
2) Rate of change of RMG-19A(B)(C), STMLN HI RNG GAMMA.

33. Given the following plant conditions:

Initial conditions:

- Mode 3.
- Main Condenser Steam Dumps are in AUTO in STEAM PRESSURE MODE.
- Tavg is 557°F, stable.
- Main Steam Header Pressure is 1092 psig, stable.
- Potentiometer setting on STM DUMP CNTRL is 8.4.

Current condition:

- Potentiometer setting on STM DUMP CNTRL is 7.5.

Which ONE of the following contains the closest values to the Main Steam Header pressure and RCS temperature that result from the current potentiometer setting?

- | | | |
|----|----------|--------|
| A. | 820 psig | 521°F. |
| B. | 820 psig | 523°F. |
| C. | 975 psig | 541°F. |
| D. | 975 psig | 543°F. |

34. Given the following plant conditions:

- Reactor is tripped.
- Small break LOCA in progress.
- All RCPs are **off**.
- EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION, in progress.
- RCS T_{AVG} is 559°F, decreasing.
- RCS T_{COLD} is 555°F, decreasing.
- ALL SG narrow range levels are 10% increasing.

Which ONE of the following describes the action required **first** to control RCS temperature for the current conditions in accordance with EOP-1.0?

- A. Close turbine drain valves MVG-2896A(B,C,D) SV-1(2,3,4).
- B. Throttle EFW flow to 50 gpm per steam generator.
- C. Close IPV-2231 MS/PEGGING STM TO DEAERATOR.
- D. Place the Steamline Power Relief A(B)(C) Mode switches in PWR RLF and adjust the controller setpoints to a higher value.

35. Given the following plant conditions:

Time 1200:

- 100% power.

Time 1205:

- PZR pressure 1868 psig, lowering.
- RB Pressure 3 psig, rising.
- Steam Generator pressures:
 - "A" 925 psig, decreasing.
 - "B" 900 psig, decreasing.
 - "C" 925 psig, decreasing.

Time 1206:

- PZR pressure 1852 psig, lowering.
- RB Pressure 3.5 psig, rising.
- Steam Generator pressures:
 - "A" 925 psig, decreasing.
 - "B" 827 psig, decreasing.
 - "C" 925 psig, decreasing.

Which ONE of the choices below completes the following?;

At 1205 the Reactor ____ (1) ____ tripped, and at 1206 Safety Injection ____ (2) ____ actuated

- | | (1) | (2) |
|----|-----------------------|-----------------------|
| A. | has | has |
| B. | has | has <u>not</u> |
| C. | has <u>not</u> | has |
| D. | has <u>not</u> | has <u>not</u> |

36. Given the following plant conditions:

- The Plant is operating at 75% power.
- RB pressure is 2.5 psig, increasing.
- RCS T_{AVG} is 582°F, increasing.
- "A" SG steam flow is 3.0 MPPH, stable.
- "A" SG feed flow is 3.7 MPPH, increasing.
- "A" SG narrow range level is 42%, decreasing.
- The CRS orders a trip of the reactor.

Which ONE of the choices below answers both of the following?:

RCS temperature will _____(1)_____ after the reactor is tripped.

EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION will direct operators to GO TO _____(2)_____

- A. 1) decrease below no-load T_{AVG} in an uncontrolled manner
2) EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT.
- B. 1) decrease below no-load T_{AVG} in an uncontrolled manner
2) EOP-3.0, FAULTED STEAM GENERATOR ISOLATION.
- C. 1) stabilize at no-load T_{AVG} shortly after the Main Feedwater Isolation Valves (FWIVs) close
2) EOP-1.2, SAFETY INJECTION TERMINATION.
- D. 1) stabilize at no-load T_{AVG} shortly after the Main Feedwater Isolation Valves (FWIVs) close
2) EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT.

37. Given the following plant conditions:

Initial conditions:

- 100% power.
- Turbine-driven EFW Pump is **inoperable**.
- All offsite power is lost (115 KV and 230 KV).

Current conditions:

- Operators are in EOP-1.1, REACTOR TRIP RECOVERY.
- Both EDGS have stopped and will **not** start from the control room.
- SG narrow range levels are 20%, decreasing slowly.

Which ONE of the following describes the required procedure transition and the **first** high level step that is performed in that procedure?

- A. Transition to EOP-15.0, RESPONSE TO LOSS OF SECONDARY HEAT SINK; Check if secondary heat sink is required.
- B. Transition to EOP-15.0, RESPONSE TO LOSS OF SECONDARY HEAT SINK; Try to establish EFW flow to at least one SG.
- C. Transition to EOP-6.0, LOSS OF ALL ESF AC POWER immediately; Verify the Reactor is tripped.
- D. Transition to EOP-6.0, LOSS OF ALL ESF AC POWER immediately; Try to restore power to any ESF bus.

38. Given the following plant conditions:

- A LOCA with a leak outside of the RB is in progress.
- The Emergency Response Organization has been activated.
- An action by an AO can be used to save a valuable piece of equipment in the Auxiliary Building.

Which ONE of the following describes the **TEDE** dose limit the AO can receive for this activity in accordance with EPP-020, EMERGENCY PERSONNEL EXPOSURE CONTROL?

- A. 5 REM
- B. 10 REM
- C. 15 REM
- D. 25 REM

39. Given the following plant conditions:

- 100% power.
- XCP-625, 2-1, FWP A/B/C TRIP lit.
- Main Feedwater pump "A" is verified tripped.

Which ONE of the following is the maximum power level directed by the Annunciator Response Procedures immediately following this event?

- A. 65 percent.
- B. 80 percent.
- C. 91 percent.
- D. 95 percent.

40. Given the following plant conditions:

Time 10:00

- 8% power.
- "A" Main Feedwater pump running.
- "B" and "C" Main Feedwater pumps TRIP/RESET switches indicate TRIP.
- Turbine-driven EFW pump is OFF.
- "A" and "B" MD EFW Pumps are in NORMAL AFTER STOP.
- Hand Controllers IFV-3531(3541)(3551), MD EFP TO SG A(B)(C) are at **0% and indicate full closed.**
- Flow Control Valve Switches FCV-3531(3541)(3551), MD EFP TO SG A(B)(C) are in MANUAL.

Time 10:02

- "A" Main Feedwater pump has **tripped.**
- Steam Generator narrow range levels are at 45%, lowering.

Which ONE of the following describes the condition of **Motor-driven** Emergency Feedwater system components?

Assume no operator actions.

- A. "A" and "B" pumps EFW Pumps are running; IFV-3531(3541)(3551) are closed.
- B. "A" and "B" pumps EFW Pumps are running; IFV-3531(3541)(3551) are 100% open.
- C. "A" and "B" pumps EFW Pumps are **off.** IFV-3531(3541)(3551) are closed.
- D. "A" and "B" pumps EFW Pumps are **off.** IFV-3531(3541)(3551) are 100% open.

41. Given the following plant conditions:

- A Large Break LOCA occurred.
- Service water flow rate indications on the Main Control Board are as follows:
 - FI-4466, SWBP A DISCH FLOW, 2550 gpm
 - FI-4468, FR LOOP A TO POND FLOW, 2550 gpm
 - FI-4496, SWBP B DISCH FLOW, 2550 gpm
 - FI-4498, FR LOOP B TO POND FLOW, 2100 gpm

Which ONE of the following will explain the above indications?

- A. A tube in 2A RBCU is leaking.
- B. A tube in 1B RBCU is leaking.
- C. There is a pipe break in the supply line to DRPI system cooling coils.
- D. MVG-3111B, RBCU 64B/65B TO IND CLG has failed to close.

42. Given the following plant conditions:

- Large Break LOCA.
- All offsite power is lost (115 KV and 230 KV).
- Diesel Generator "B" failed to start.

Which ONE of the following events will result in a loss of all AC power?

- A. Bus 1DA overcurrent lockout.
- B. "A" EDG differential relay actuation.
- C. "A" EDG negative phase sequence.
- D. "A" EDG ground overcurrent relay actuation.

43. Given the following plant conditions:

Initial condition:

- 100% power.
- All offsite power was lost (115 KV and 230 KV).
- "A" **and** "B" EDG failed to start.

Current condition:

- Power will be restored via XTF5052 , ALTERNATE AC SOURCE TRANSFORMER in accordance with SOP-304, 115KV/ 7.2KV OPERATIONS.

Which ONE of the choices below answers **both** of the following:

- 1) What is the **maximum** number of 7.2 KV ESF busses that can be restored from this source at one time in accordance with SOP-304?
- 2) Which 7.2 KV ESF bus can be energized **only** by its ALTERNATE feeder breaker from this source?

A. 1) 1 bus.
2) 1DA.

B. 1) 1 bus.
2) 1DB.

C. 1) 2 busses.
2) 1DA.

D. 1) 2 busses.
2) 1DB.

44. Given the following plant conditions:

Initial conditions:

- 100% power.
- Battery Charger XBC-1A is adjusted to provide an equalizing charge.
- XBC-1A output breaker is closed on bus 1HA .

Current condition:

- 1HA voltage is 140 VDC.

Which ONE of the following describes the current source of power for 125 VDC distribution panel 1HA?

- A. 125 VDC storage battery XBA-1X.
- B. 125 VDC storage battery XBA-1A.
- C. Battery charger XBC-1A, powered by XMC-1DA2X.
- D. Battery charger XBC-1A, powered by XMC-1DA2Y.

45. Given the following plant conditions:

- All offsite power is lost (115 KV and 230 KV).
- "A" D/G is supplying the 1DA bus.
- A transfer of 1DA to bus 1DX is in progress as directed by SOP-306 EMERGENCY DIESEL GENERATOR.

Which ONE of the following describes a required action and a condition that will be satisfied prior to paralleling the offsite source to the 1DA bus in accordance with SOP-306?

A. "A" D/G TEST switch is turned to START;

Synchroscope rotating slowly in the **fast** direction.

B. "A" D/G TEST switch is turned to START;

Synchroscope rotating slowly in the **slow** direction.

C. DG A SYNC SEL placed in EMERG;

Synchroscope rotating slowly in the **slow** direction.

D. DG A SYNC SEL placed in EMERG;

Synchroscope rotating slowly in the **fast** direction.

46. Given the following plant conditions:

- 100% power initially.
- Loss of Instrument Air has occurred.
- The crew has entered AOP-220.1, LOSS OF INSTRUMENT AIR.
- The reactor is now tripped.
- Operators have been dispatched to operate the SG PORVs locally.

Which ONE of the choices below completes the following statement?

Operators are cautioned to maintain steam generator steam loads balanced in AOP-220.1 in order to:

- A. prevent a safety injection.
- B. avoid a stall of natural circulation.
- C. reduce the starting duties of EFW pumps.
- D. maintain steam generator pressures less than the code safety setpoint.

47. Given the following plant conditions:

- Plant is in Mode 3.
- Personnel Hatch inner door has been declared INOPERABLE due to a bad seal.
- Personnel Hatch outer door is closed and OPERABLE.
- All other containment penetrations are OPERABLE.
- Action statement of T.S. 3.6.1.3, CONTAINMENT AIR LOCKS has been entered.

Which ONE of the following identifies the lowest Mode in which the Personnel Hatch doors are required to be operable and whether Technical Specification L.C.O. 3.6.1.1, CONTAINMENT INTEGRITY is met for the current conditions?

- A. Mode 3; T.S. 3.6.1.1 is met.
- B. Mode 3; T.S. 3.6.1.1 is not met.
- C. Mode 4; T.S. 3.6.1.1 is met.
- D. Mode 4; T.S. 3.6.1.1 is not met.

48. Given the following plant conditions:

- AO reports the following alarm at Waste Gas Recombiner "A" panel:

XPB-7209, 1-2, "HARC-1104 OAIC-1112 HI-HI H₂/O₂ O₂ SHUTDOWN"

Which ONE of the following describes the setpoint for oxygen concentration that will cause this alarm and a valve, or set of valves, that will automatically close?

- A. 2%;
HCV-1118A RECOMBINER A OXYGEN ADDITION VALVE only
- B. 2%;
HCV-1118A RECOMBINER A OXYGEN ADDITION VALVE and
PCV-1092, VOLUME CONTROL TANK ISOLATION VALVE.
- C. 4%;
HCV-1118A RECOMBINER A OXYGEN ADDITION VALVE only
- D. 4%;
HCV-1118A RECOMBINER A OXYGEN ADDITION VALVE and
PCV-1092, VOLUME CONTROL TANK ISOLATION VALVE.

49. Given the following plant conditions:

- 100% power.
- XCP-645, 1-5, CR SPLY RM-A1 HI RAD in alarm.
- XCP-645, 2-6, CR SPLY GAS RM-A1 TRBL in alarm.
- I&C has identified a failed power supply.
- The SS has declared the RM-A1 channel INOPERABLE.

Which ONE of the following describes whether an automatic action has occurred and an action, if any, that is required by T.S. L.C.O. 3.3.3.1, RADIATION MONITORING INSTRUMENTATION?

- A. No automatic action has occurred; Establish Control Room Emergency Ventilation within 1 hour.
- B. Control Room Emergency Ventilation has actuated; Secure one train of Emergency Ventilation within 30 minutes.
- C. Control Room Emergency Ventilation has actuated; No further actions are required by Technical Specifications.
- D. No automatic action has occurred; Perform area surveys and sampling within 1 hour.

50. Given the following plant conditions:

- A loss of coolant accident has occurred.
- Operators are taking actions as directed by EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT.
- Operators are monitoring the IPCS screen to assess plant conditions.
- The Critical Safety Function status flags on the IPCS screens are **INOPERABLE**.

Which ONE of the following CSFST items is indicated by parameters noted on the IPCS display?

REFERENCE PROVIDED

- A. Red Path on Containment.
- B. Red Path on Heat Sink.
- C. Orange Path on Core Cooling.
- D. Red path on Core Cooling.

51. Which ONE of the choices below identifies the power supply to "B" Service Water pump:

- A. 1DB
- B. 1EB
- C. 1DB1
- D. 1EB1

52. Given the following plant conditions:

- 100% power.
- Service Water Pump Discharge temperature is 91.5°F.
- Service Water Pond level is at 417.4 feet.

Which ONE of the following describes the Technical Specification limit that has been **violated** and the effect on plant systems?.

A. Service Water Pump discharge temperature is above the limit.

Jeopardizes the ability of ESF systems to cool the RCS during accident conditions.

B. Service Water Pump discharge temperature is above the limit.

Reduces the ability to maintain Reactor Building temperature below its limit during normal operation.

C. Service Water Pond Level is below the limit.

Reduces level below Net Positive Suction Head requirements for Service Water pumps.

D. Service Water Pond Level is below the limit.

Jeopardizes the ability to perform a normal plant cooldown.

53. Given the following plant conditions:

- AOP-301.1, RESPONSE TO ELECTRICAL GRID ISSUES, in progress.
- 60% power.
- Generator Megawatts - 615 MWe.
- MVARs - 200 MVARs, lagging.
- Generator Hydrogen pressure - 60 psig.
- GEN VOLT REG XFER Switch is in AUTO.
- The BOP operator is increasing Generator Voltage.

Which ONE of the following identifies the maximum limit for MVARs specified by AOP-301.1 **without** System Controller approval and describes how the EXCITER VOLTS meter is returned to 0% after each voltage adjustment?

A. 325 MVARs.

The EXCITER VOLTS meter automatically trends toward 0% after each adjustment.

B. 484 MVARs.

The EXCITER VOLTS meter automatically trends toward 0% after each adjustment.

C. 325 MVARs.

The operator adjusts EXC FIELD VOLT ADJ (MAN) to obtain EXCITER VOLTS indication of 0% after each adjustment.

D. 484 MVARs.

The operator adjusts EXC FIELD VOLT ADJ (MAN) to obtain EXCITER VOLTS indication of 0% after each adjustment.

54. Given the following plant conditions:

Time 13:00:

- Initially at 100% power.
- RB Air system leak is occurring.
- RB Air Header pressure - 80 psig, decreasing.
- Reactor Trips.
- Safety Injection occurs.

Time 13:05:

- RB Air Header pressure - 40 psig, decreasing.
- Actions to reset ESF systems have **not** been performed.
- Pressurizer pressure - 2300 psig, increasing.

Which ONE of the following describes the position of IPV-2659, INSTR TO RB AIR HDR VLV and whether Pressurizer PORVs will open at their setpoint under the current conditions?

- | | |
|------------------------|-------------------------------|
| A. IPV-2659 is OPEN; | Two (2) PORVs will open. |
| B. IPV-2659 is OPEN; | All PORVs will remain closed. |
| C. IPV-2659 is CLOSED; | Two(2) PORVs will open. |
| D. IPV-2659 is CLOSED; | All PORVs will remain closed. |

55. Given the following plant conditions:

- 100% power.
- Instrument Air Header pressure - 85 psig, decreasing.

Which ONE of the following identifies the next automatic action that will occur if Instrument Air Header pressure continues to lower?

- A. Start of Diesel Air Compressor.
- B. Start of the Supplemental Air Compressor.
- C. Start of the Station Instrument Air Compressor selected for Standby.
- D. Full closure of IPV-8324, STATION AIR SUPPLY HDR PRESS CONT VALVE.

56. Given the following plant conditions:

- Main Transformer Fire occurred.
- Fire Suppression System deluge actuated.
- Reactor tripped.
- All 230 KV power is lost.

Which ONE of the following describes the expected Fire Header pressure transient and the Fire Protection System response?

- A. System pressure will lower and stabilize at 105 psig and **only** the Jockey pump will be running.
- B. System pressure will lower to less than 95 psig and **only** the Electric Fire pump will be running.
- C. System pressure will lower to less than 85 psig and **only** the Diesel Fire pump will be running.
- D. System pressure will lower to less than 85 psig and **both** the Diesel Fire pump and the Electric Fire pump will be running.

57. Given the following plant conditions:

- LOCA has occurred.
- Safety Injection is actuated.
- Reactor Building pressure indicates 14 psig and rising slowly.
- EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION, in progress.
- The following Containment Isolation Valve MCB Status Lights are BRIGHT:
 - RCP SL WTR ISOL 8100
 - LTDN ISOL 8152

Which ONE of the following identifies the containment isolation feature that has **not** functioned correctly and an action required by EOP-1.0?

- A. Phase A; Place **either** Phase A actuation switches in the ACTUATE position.
- B. Phase A; Place **both** Phase A actuation switches in the ACTUATE position.
- C. Phase B; Place **either** RB Spray/Phase B actuation switches in the ACTUATE position.
- D. Phase B; Place **both** RB Spray/Phase B actuation switches in the ACTUATE position.

58. Given the following plant conditions:

- Core off-load was in progress.
- A complete loss of RHR cooling has occurred.
- The Reactor Building has been evacuated.
- XVB-2B, RB PURGE EXHAUST ISOLATION VALVE, and XVB-2A, RB PURGE EXHAUST ISOLATION VALVE, will not close from the HVAC Panel.

Which ONE of the choice below answers both of the following:

- 1) If operators are successful in closing only ONE (1) RB Purge Exhaust Isolation Valve, can Containment Closure be satisfied in accordance with OAP-108.4, OPERATIONS OUTAGE CONTROL OF CONTAINMENT PENETRATIONS?
 - 2) Where will an AO be directed to locally close one of these valves outside of the Reactor Building?
- A. 1) Containment Closure can be satisfied with one valve.
2) Fuel Handling Building.
 - B. 1) Containment Closure can be satisfied with one valve.
2) Auxiliary Building.
 - C. 1) Containment Closure will not be satisfied with one valve.
2) Fuel Handling Building.
 - D. 1) Containment Closure will not be satisfied with one valve.
2) Auxiliary Building.

59. Which ONE of the following identifies a position that may enter the Green Carpet Area in the Control Room without BOP or NROATC approval in accordance with SAP-200, CONDUCT OF OPERATIONS.
- A. Shift Engineer.
 - B. Management Duty Supervisor.
 - C. NRC Resident Inspector.
 - D. Work Control Center SRO.

60. Given the following plant conditions:

- Initially at 100% power.
- "C" Steam generator ruptured.
- EOP-1.0, REACTOR TRIP SAFETY/ INJECTION ACTUATION has been entered.
- "C" NR SG level is 22%, rising.
- RM-G19C, STMLN HI RNG GAMMA is in alarm.
- "A" and "B" NR SG levels are 10%, rising.

Which one of the following valve manipulations can be performed without specific direction from an EOP step under the **current** plant conditions in accordance with OAP-103.4, EOP/AOP USER'S GUIDE?

- A. Closure of "C" MSIV.
- B. Complete Isolation of EFW flow to "C" SG.
- C. Throttling of EFW flow to 50 gpm to "C" SG.
- D. Isolation of steam to the Turbine-driven EFW pump from "C" SG.

61. Given the following plant conditions:

Initial conditions:

- Initially at 100% power.
- Loss of MFP "A" occurred.

Current conditions:

- AOP-210.3, FEEDWATER PUMP MALFUNCTION, in progress.
- Power reduction is in progress.
- Rod control is in AUTO.
- Adjustment to RCS boron concentration **completed**.
- Main Generator load 600MW, decreasing.
- T_{AVG} 578.7°F, decreasing.
- T_{REF} 577°F, decreasing.
- XCP-621, 1-2, CRB INSRT LMT LO in alarm.

Which ONE of the following describes a cause and an appropriate corrective action, or set of actions, for the current condition?

- A. The controlling first stage Turbine pressure failing low; Select the operable controlling channel.
- B. The controlling first stage Turbine pressure failing low; Borate and withdraw rods above the Rod Insertion Limit.
- C. Turbine load was lowered too low for the amount of boration; Discontinue the load decrease **only**.
- D. Turbine load was lowered too low for the amount of boration; Discontinue the load decrease **and** perform an emergency boration from the RWST.

62. Given the following plant conditions:

- Plant startup in progress.
- 2% power, increasing.
- Control Bank D is 115 steps withdrawn.
- XCP-639, 1-2, BUS 1B O/C 51BX-1B alarms.

Which ONE of the following describes an action that will satisfy Technical Specification requirements if it is the only action taken within one (1) hour of the 51BX lockout of Bus 1B?

- A. Clear the cause of the lockout and reenergize bus 1B.
- B. Insert only the Control Bank rods to zero steps.
- C. Stabilize reactor power at 2% power.
- D. Manually trip the Reactor.

63. Given the following plant conditions:

- 100% power.
- RCS leak rate data is as follows:
 - Total RCS leakage rate is 10.2 gpm.
 - Leakage to PRT is 7.5 gpm.
 - Leakage to the Reactor Coolant Drain Tank is 1.3 gpm.
 - RCS to Steam Generator leakage is as follows:
 - * "A" SG 0.09 gpm
 - * "B" SG 0.08 gpm
 - * "C" SG 0.07 gpm

Which ONE (1) of the following describes RCS leakage in relation to Technical Specification limits of T.S. 3.4.6.2, REACTOR COOLANT SYSTEM - OPERATIONAL LEAKAGE?

- A. Identified leakage is greater than the limit.
- B. Unidentified leakage is greater than the limit.
- C. Primary to Secondary leakage is greater than the limit.
- D. Pressure Boundary leakage is greater than the limit.

64. Given the following plant conditions:

- A waste gas release was in progress.
- HCV-014, WASTE GAS DISCHARGE CONTROL VALVE, has tripped shut.
- XCP-644, 3-1, PLANT VENT GAS RM-A3 HI RAD in alarm.
- XCP-645, 2-3, GAS WST DISCH RM-A10 HI RAD has **not** alarmed during the release.

Which ONE of the choices below answers **both** of the following:

- 1) What condition must be satisfied prior to recommencing the release?
 - 2) What is the **minimum** control manipulation necessary to enable opening of HCV-014?
- A. 1) RM-A3 reading must decrease to pre-release background reading.
2) HCV-014 **selector switch** must be cycled to CLOSE, then the valve re-opened.
- B. 1) A Request for Redundant Analysis must be initiated.
2) HCV-014 **controller** must be taken to ZERO (0), then the valve re-opened.
- C. 1) A Request for Redundant Analysis must be initiated.
2) HCV-014 **selector switch** must be cycled to CLOSE, then the valve re-opened.
- D. 1) RM-A3 reading must decrease to pre-release background reading.
2) HCV-014 **controller** must be taken to ZERO (0), then the valve re-opened.

65. Given the following plant conditions:

- 100% power.
- A motor-operated valve (MOV) located in a High Radiation Area must be Red Danger tagged CLOSED to perform work.
- The general area radiation field at the valve is 8 Rem/ Hr.
- It will take approximately 15 seconds at the valve to verify it's position.

Which ONE of the choices below answers both of the following?:

- 1) What is the appropriate radiological posting for the area above in accordance with HPP-0160, CONTROL AND POSTING OF RADIATION CONTROL ZONES?
 - 2) What is a procedurally allowed method for reducing radiological exposure for this task in accordance with SAP-153, COMPONENT/CONDITION VERIFICATION?
- A. 1) Locked High Radiation Area.
2) Waive the requirement for independent verification.
- B. 1) Locked High Radiation Area.
2) Have an HP technician concurrently verify the positioning of the valve.
- C. 1) Very High Radiation Area.
2) Waive the requirement for independent verification.
- D. 1) Very High Radiation Area.
2) Have an HP technician concurrently verify the positioning of the valve.

66. Given the following plant conditions:

- 100% power
- Power is lost to 125 VDC circuit XPN6096.
- Operators are responding as directed by AOP-100.5, LOSS OF MAIN CONTROL BOARD ANNUNCIATORS.

Which ONE of the choices below contains the total percentage of INOPERABLE Main Control Board annunciators and the correct surveillance activity associated with the failed annunciator(s) in accordance with AOP-100.5?

REFERENCE PROVIDED

- | | |
|------------|---------------------------|
| A. 17.0 %; | GTP-702, Attachment IV.D. |
| B. 18.3 %; | GTP-702, Attachment IV.D. |
| C. 17.0 %; | GTP-702, Attachment IV.G. |
| D. 18.3 %; | GTP-702, Attachment IV.G. |

RESTORATION OF FAILED MAIN CONTROL BOARD ANNUNCIATORS

A. Make a list of the annunciator panels lost.

B. Contact I&C to verify the source of power to the annunciator panel per the following table.

DPN 1HA2 04		
XP6091	XCP-601, 604, 606, 608, 622, 629, 636	13.7% MCB ANNUNCIATORS
13.7% MCB ANNUNCIATORS TOTAL		

DPN 1HX1 02		
XP6092	XCP-603, 628, 630, 631, 632, 633	20.3% MCB ANNUNCIATORS
XP6093	XCP-625, 627, 634, 635, 638	18.3% MCB ANNUNCIATORS
38.6% MCB ANNUNCIATORS TOTAL		

DPN 1HB 02		
XP6094	XCP-602, 605, 607, 609, 623, 637	12.4% MCB ANNUNCIATORS
12.4% MCB ANNUNCIATORS TOTAL		

DPN 1HX1 01		
XP6095	XCP-610, 611, 612, 613, 614, 615, 616	18.3% MCB ANNUNCIATORS
XP6096	XCP-617, 618, 619, 620, 621, 624, 626	17.0% MCB ANNUNCIATORS
35.3% MCB ANNUNCIATORS TOTAL		

C. Determine if the actions taken in response to a failed annunciator are subject to OAP-113.1, Operator Workaround and Dark Board Program.

SURVEILLANCE ANNUNCIATORS

NOTE

This matrix is to aid in identifying failed annunciators which have surveillance requirements.
 The applicable ARP should be utilized when performing the surveillance.

PANEL	WINDOW	SURVEILLANCE	ATTACHMENT
XCP-615	2-5	GTP-702	IV.G
XCP-615	3-3	GTP-702	VI.V-3
XCP-615	3-6	OAP-106.1 STP-114.002	RB SUMP LEVEL N/A
XCP-620	1-5	GTP-702	IV.E
XCP-620	1-6	GTP-702	IV.E
XCP-620	2-4	GTP-702	IV.D
XCP-620	2-5	GTP-702	IV.B
XCP-620	4-2	GTP-702	VI.L-2
XCP-620	4-3	GTP-702	VI.L-2
XCP-621	1-1	GTP-702	IV.C
XCP-632	6-5	GTP-702	IV.B, IV.D, IV.E, VI.KK, VI.NN
		OAP-106.1	RB TEMPS RB SUMP LEVEL MW/KV/MVARS GENERIC LOG SR NI
		OAP-100.6	OPERATION AT LICENSED LIMIT
		OAP-107.1	RESTORATION OF IPCS FUNCTIONS
XCP-638	1-4	OAP-106.1	MW/KV/MVARS
XCP-638	2-4	OAP-106.1	MW/KV/MVARS

67. Given the following plant conditions:

- LOCA occurred two (2) hours ago.
- The Emergency Response Organization has been activated.
- All Auxiliary Operators (AOs) have been released to the OSC.
- Two AOs are in the AB performing activities assigned by the Lead Operator.
- Valves must be closed locally as directed by Emergency Operating Procedures.

Which ONE of the following describes how AOs are redirected to perform the required valve closures in accordance with EPP-028, OPERATIONS SUPPORT CENTER?

- A. The Control Room notifies the Lead Operator who then redirects the AOs.
- B. The Control Room redirects the AOs directly and notifies the Lead Operator.
- C. The Operations Supervisor in the TSC redirects the AOs directly.
- D. The Control Room redirects AOs directly and notifies the OSC Logistics Coordinator.

68. Given the following plant conditions:

- Mode 5.
- RCS Drain Down to Mid Loop is in progress.
- "A" RHR loop is in service.
- During the drain down, "A" RHR pump amps and discharge pressure begin fluctuating erratically.
- RHR flow is fluctuating between 800-1200 gpm.
- The crew enters AOP-115.1, RHR PUMP VORTEXING.
- The drain-down is stopped.

Which ONE of the following is the **first** action that will be performed in accordance with AOP-115.1?

- A. Reduce RHR flow.
- B. Stop the "A" RHR pump.
- C. Increase normal charging flow.
- D. Align "B" RHR pump to the RWST.

69. Given the following plant conditions:

Initial conditions:

- 100% power.
- An automatic reactor trip and safety injection occurred.
- "A" Steam Generator was determined to be faulted and isolated in accordance with procedure.
- EOP-1.2, SI TERMINATION, in progress.
- "A" Charging pump stopped.
- Normal Charging is aligned.

Current conditions:

- "B" Steam Generator is faulted.
- "C" Steam Generator is ruptured.
- RCS pressure is 1775, decreasing.
- EOP-1.5, REDIAGNOSIS, has been entered.

Which ONE of the following identifies the procedure that will be identified for use in accordance with EOP-1.5?

- A. EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION.
- B. EOP-3.0, FAULTED STEAM GENERATOR ISOLATION.
- C. EOP-4.0, STEAM GENERATOR TUBE RUPTURE.
- D. EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.

70. Given the following plant conditions:

- Small Break LOCA occurred.
- EOP-2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION, in progress.
- "A" RCP is running only.
- Both Charging Pumps are running in injection mode.
- Operators have been directed by EOP-2.1 to depressurize the RCS to refill the Pressurizer.

Which ONE of the following will provide the most effective depressurization?

- A. Open PVT-8145, PZR SPRAY FR CVCS.
- B. Open PCV 444C, PZR SPRAY only.
- C. Open PCV 444D, PZR SPRAY only.
- D. Open both PCV 444D, PZR SPRAY and PCV 444C, PZR SPRAY.

71. Given the following plant conditions:

- A LOCA outside the RB has occurred.
- The crew is performing actions as directed by EOP-2.5, LOCA OUTSIDE CONTAINMENT.
- RWST level 87%, decreasing.
- RCS pressure 1770 psig, decreasing.
- Pressurizer level 0%

Which ONE of the following describes the action(s) that will be used **first** in an attempt to isolate the break and the indication that will be used to determine if the action was successful in accordance with EOP-2.5?

- A. Close MVG-8888A, RHR LP A TO COLD LEGS **only** then check if RCS pressure is continuing to decrease.
- B. Close MVG-8888A, RHR LP A TO COLD LEGS **only** then observe Pressurizer level return on scale.
- C. Close **both** MVG-8888A, RHR LP A TO COLD LEGS and MVG-8888B, RHR LP B TO COLD LEGS simultaneously, then check if RCS pressure is continuing to decrease.
- D. Close **both** MVG-8888A, RHR LP A TO COLD LEGS and MVG-8888B, RHR LP B TO COLD LEGS simultaneously, then observe Pressurizer level return on scale.

72. Given the following plant conditions:

- 100% power initially.
- Steam leak in the Reactor building occurred.
- Reactor was tripped manually.
- **All** EFW pumps failed to start.
- EOP-15.0, LOSS OF SECONDARY HEAT SINK was entered.
- RB pressure has been **steadily rising** since the reactor trip, currently at 9 psig and rising.
- Operators stopped all RCPs.
- Pressurizer PORVs have opened at setpoint and then re-closed twice in the past ONE (1) minute.
- The following parameters are noted:
 - RCS Pressure 2280 psig, increasing.
 - Core Exit Thermocouples 565°F, increasing.
 - RCS THOT 565°F, increasing.
 - RCS TCOLD 550°F, stable.
 - Steam Generator WR levels are as follows:

"A"	24%, decreasing.
"B"	16%, decreasing.
"C"	18%, decreasing.

Which ONE of the following describes the purpose for tripping the RCPs and the action required for the current conditions?

- A. RCPs were tripped to reduce heat input to the RCS;
Implement steps to establish bleed and feed cooling.
- B. RCPs were tripped to reduce heat input to the RCS;
Continue attempts to restore feedwater.
- C. RCPs were tripped because CCW to RCP motor bearing coolers was lost;
Implement steps to establish bleed and feed cooling.
- D. RCPs were tripped because CCW to RCP motor bearing coolers was lost;
Continue attempts to restore feedwater.

73. Given the following plant conditions:

- A Small break LOCA occurred.
- A Steam Generator Tube Rupture subsequently occurred.
- EOP-4.3, SGTR WITH LOSS OF REACTOR COOLANT: SATURATED RECOVERY, in progress.
- MVG-8801A(B) HI HEAD TO COLD LEG INJ are both shut.
- Operators have intentionally depressurized the RCS to obtain 0°F subcooling.
- All RCPs are off.

Which ONE of the following identifies a parameter that operators will monitor to determine if injection should be reinitiated in accordance with the Reference Page of EOP-4.3?

- A. Pressurizer level.
- B. RVLIS Narrow Range Level.
- C. RVLIS Wide Range Level.
- D. RCS Hot leg temperature.

74. Given the following plant conditions:

- Small break LOCA occurred.
- Neither RHR pump is available.
- EOP-2.4, LOSS OF EMERGENCY COOLANT RECIRCULATION, in progress.
- RCS cooldown in progress.
- Operators are intentionally minimizing subcooling by depressurizing as directed in EOP-2.4.

Which ONE of the following describes the purpose for depressurizing to the minimum specified subcooling in accordance with EOP-2.4?

- A. Lower break flow.
- B. Refill the pressurizer.
- C. Increase charging flow.
- D. Inject accumulators.

75. Given the following plant conditions:

Time 10:00:

- 100% power.
- Large break LOCA occurred.
- Significant fuel damage occurred.
- IPCS is **not available**.

Time 10:15

- RB Pressure peaked at 37 psig and then began to decrease.
- RM-G7 and RM-G18 peaked at 2000 R/hr, and then began to decrease.

Time 10:50

- RB Pressure reads 6 psig, decreasing.
- RM-G7 and RM-G18 read 980 R/hr.

Time 11:05

- RB Pressure reads 3.5 psig, decreasing.
- RM-G7 and RM-G18 read 900 R/hr.

Which ONE of the choices below answer both of the following in accordance with OAP-103.4, EOP/AOP USER'S GUIDE?:

- 1) What is the **earliest** time given above at which RB pressure has returned to less than the threshold for Adverse Containment?
- 2) Will operators stop using Adverse Containment (bracketed) values at that time?

- A. 1) 10:50.
2) No.
- B. 1) 10:50.
2) Yes.
- C. 1) 11:05.
2) No.
- D. 1) 11:05.
2) Yes.

76. Given the following plant conditions:

Time 12:00:

- 100% power.
- Control Bank "A" Rod K-2 dropped to 40 steps withdrawn.

Time 12:45:

- QPTR on IPCS indicates 1.01, stable.
- 70% power.
- Shutdown Margin has been verified.
- The misaligned rod cannot be moved due to a Rod Control system malfunction.
- The rod has been verified **trippable**.
- The plant **will remain at power.**

Which ONE of the following identifies the Reactor Protection system setpoints that must be changed and how safety analyses will be validated in accordance with T.S. 3.1.3, MOVABLE CONTROL ASSEMBLIES?

- A. Overpower ΔT and High flux trip setpoints will be reduced.
Reevaluate accidents affected by rod misalignment.
- B. **Only** High flux trip setpoints will be reduced.
Reevaluate accidents affected by rod misalignment.
- C. Overpower ΔT and High flux trip setpoints will be reduced.
Ensure remaining rods are above Rod Insertion Limits.
- D. **Only** High flux trip setpoints will be reduced.
Ensure remaining rods are above Rod Insertion Limits.

77. Given the following plant conditions:

- Mode 3.
- All RCPs are OPERABLE.
 - "A" RCP is running.
 - "B" and "C" RCPs are OFF.
- Wide Range Steam Generator levels:

"A"	51%
"B"	50%
"C"	7%
- The 12 hour Surveillances for T.S. 3.4.1.2, REACTOR COOLANT SYSTEM, HOT STANDBY were last performed at 0730, today.

Which ONE (1) of the following describes the number of RCS loops that are currently OPERABLE in accordance with T.S. 3.4.1.2 and the latest time at which the surveillances can be performed before they are considered missed surveillances?

- A. One (1) OPERABLE loop; 2230 today.
- B. One (1) OPERABLE loop; 0730 tomorrow.
- C. Two (2) OPERABLE loops; 2230 today.
- D. Two (2) OPERABLE loops; 0730 tomorrow.

78. Given the following plant conditions:

- Mode 3.
- Plant startup in progress.
- XCP-616, 4-2, PZR RLF LINE TEMP HI is in alarm.
- XCP-616, 4-4, PRT LVL LO/TEMP/LVL/ PRESS HI is in alarm.
- Leakrate to the PRT 1.1 gpm, stable.
- PRT pressure 10 psig, rising.
- Pressurizer level 25%, stable.
- Pressurizer pressure 935 psig, stable.
- VCT makeup frequency increasing.
- FCV-122, CHG FLOW output has risen slightly since beginning of shift.
- PZR PORV tailpipe temperatures 260, rising.

Which ONE of the choices below answer both of the following?:

- 1) Which procedure contains the guidance to identify and isolate the leaking PORV?
 - 2) If a Block valve is closed on a leaking PORV, can the startup and heatup up to **and including** Mode 1 continue in accordance with Technical Specifications?
- A. 1) AOP-101.1, LOSS OF REACTOR COOLANT NOT REQUIRING SI.
2) Yes.
- B. 1) AOP-101.1, LOSS OF REACTOR COOLANT NOT REQUIRING SI.
2) No.
- C. 1) SOP-101, REACTOR COOLANT SYSTEM.
2) Yes.
- D. 1) SOP-101, REACTOR COOLANT SYSTEM.
2) No.

79. Given the following plant conditions:

Initial conditions:

- Loss of all offsite power occurred (230KV and 115KV)
- Reactor trip occurred.
- Diesel Generator "B" FAILED to start.

Current conditions:

- Power has been restored to Bus 1DX via XTF0005.

Which ONE of the following procedural actions is required to enable closing the supply breaker to 1DB from 1DX and the procedure that will provide this guidance?

- A. Place the ESF Loading Sequencer resets in NON-ESF LCKOUTS in accordance with SOP-306, EMERGENCY DIESEL GENERATOR.
- B. DE-ENERGIZE the power supply to the ESF loading sequencer in accordance with SOP-306, EMERGENCY DIESEL GENERATOR.
- C. DE-ENERGIZE the power supply to the ESF loading sequencer in accordance with AOP-304.1, LOSS OF BUS 1DA(1DB) WITH THE DIESEL NOT AVAILABLE.
- D. Place the ESF Loading Sequencer resets in NON-ESF LCKOUTS in accordance with AOP-304.1, LOSS OF BUS 1DA(1DB) WITH THE DIESEL NOT AVAILABLE.

80. Given the following plant conditions:

Initial conditions:

- Pressurizer level channel LT-459 failed low.
- LCV-459 and LCV-460, LTDN LINE ISOL closed.
- RCS pressure 2300, rising.

Current conditions.

- Reactor was manually tripped.
- PZR Spray Valve PCV-444D failed OPEN and could **not** be closed manually.
- RCS pressure is 1980 psig, lowering at 50 psig per minute.
- RB pressure 0.5 psig, stable.
- All Steam Generator pressures 1050 psig, stable.
- LCV-459 LTDN LINE ISOL **cannot** be opened.
- Step 5 of EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION in progress.

Which ONE of the choices below completes the following statements?:

In order to mitigate the failure of PCV-444D, operators will stop RCPs as directed in _____(1)_____.

If RCS pressure subsequently trends high, operators will _____(2)_____ to control pressure.

- A. 1) EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION.
2) open a PZR PORV.
- B. 1) EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION.
2) initiate Auxiliary Spray.
- C. 1) EOP-1.1, REACTOR TRIP RECOVERY
2) open a PZR PORV
- D. 1) EOP-1.1, REACTOR TRIP RECOVERY.
2) initiate Auxiliary Spray

81. Given the following plant conditions:

- A loss of coolant accident has occurred.
- EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT in progress.
- RB pressure 31 psig, lowering.
- NR RVLIS 32%, lowering.
- Core Exit Thermocouples 670°F, rising.
- RCS T_{HOT} Indications 580°F, rising.
- All RCPs are off.

Which ONE of the following describes the Core Cooling Critical Safety Function status, and the basis for RVLIS indication used in determining that status, in accordance with the Emergency Response Guideline bases?

- A. A degraded core cooling condition exists; Collapsed liquid level is within the bottom 3.5 feet of core.
- B. A degraded core cooling condition exists; Void fraction is greater than 50%.
- C. An inadequate core cooling condition exists; Void fraction is greater than 50%.
- D. An inadequate core cooling condition exists; Collapsed liquid level is within the bottom 3.5 feet of core.

82. Given the following plant conditions:

- Large Break LOCA in the Reactor Building.
- RB pressure is 18 psig, rising.
- "A" and "B" RB Spray pumps are OFF and cannot be started.
- "1A" RBCU is running.
- "2B" RBCU is running.
- XCP-604, 3-1, SW FR 1A/ 2A FLO LO in alarm.
- SWBP "A" failed to start automatically.
- XVB-3107A, RBCU 64A/ 65A RTN TO SW PND is OPEN.

Which ONE of the choices below answers both of the following:

- 1) Is a full train of containment depressurization equipment operating as evaluated for the Fission Product Barrier Matrix?
 - 2) What action is required prior to starting SWBP "A" in accordance with EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION?
- A. 1) Yes.
2) Close XVB-3107A; Fill "A" Train RBCUs per SOP-117, SERVICE WATER SYSTEM.
- B. 1) No.
2) Close XVB-3107A; Fill "A" Train RBCUs per SOP-117, SERVICE WATER SYSTEM.
- C. 1) Yes.
2) Close XVB-3107A **only**.
- D. 1) No.
2) Close XVB-3107A **only**.

83. Given the following plant conditions:

- Mode 6
- "A" RHR loop aligned for shutdown cooling.
- "A" RHR pump running.
- "B" RHR loop aligned for shutdown cooling.
- "B" RHR pump OFF and is inoperable..
- Refueling cavity level 461', 6", stable.
- RH HX "A" flow indicator 2250 gpm, stable.

Which ONE of the choices below completes both of the following?:

The status of the RHR loops indicates that T.S. 3/4.9.7 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION ____ (1) ____ met.

In accordance with Technical Specification bases, the minimum limit for RHR flow ensures that _____ (2) _____ .

- A. 1) is
2) the effects of inadvertent dilution are minimized and that boron stratification is prevented.
- B. 1) is
2) decay heat removal is sufficient to maintain RCS temperature less than 120°F.
- C. 1) is **not**
2) the effects of inadvertent dilution are minimized and that boron stratification is prevented.
- D. 1) is **not**
2) decay heat removal is sufficient to maintain RCS temperature less than 120°F.

84. Given the following plant conditions:

Time 1100, 8/19/13.

- 100% power
- "A" Charging pump is in service.
- "B" Charging pump was declared INOPERABLE.
- "B" Charging Pump breaker XPP0043B **cannot** be racked down due to a problem with the breaker racking mechanism.
- "C" Charging pump breaker XPP0043C is racked up on "B" train.

Time 1300, 8/19/13.

- XCP-614, 2-6, CCW TO CHG PP A VLV NOT FULL OPEN, is in alarm.
- Valve XVG-9684A-CC, CC WTR TO CHG PP A, indicates shut.
- "A" Charging pump temperatures are being locally monitored using Attachment 3 of AOP-118.1, TOTAL LOSS OF COMPONENT COOLING WATER as a reference
- "A" Charging pump temperatures are stable.

Which ONE of the following describes ECCS trains that are INOPERABLE based on the status of Charging pumps and the **latest time** by which the plant must be placed in HOT STANDBY in accordance with Technical Specifications?

REFERENCE PROVIDED

- A. **Both** ECCS Trains are INOPERABLE; 1900, 8/19/13.
- B. **Both** ECCS Trains are INOPERABLE; 2000, 8/19/13.
- C. "B" ECCS Train is INOPERABLE **only**; 1700, 8/22/13.
- D. "A" ECCS Train is INOPERABLE **only**; 1900, 8/22/13.

EMERGENCY CORE COOLING SYSTEMS

3/4.5.2 ECCS SUBSYSTEMS - $T_{avg} \geq 350^{\circ}\text{F}$

LIMITING CONDITION FOR OPERATION

3.5.2 Two independent Emergency Core Cooling System (ECCS) subsystems* shall be OPERABLE with each subsystem comprised of:

- a. One OPERABLE centrifugal charging pump,
- b. One OPERABLE residual heat removal heat exchanger,
- c. One OPERABLE residual heat removal pump, and
- d. An OPERABLE flow path capable of taking suction from the refueling water storage tank on a safety injection signal and automatically transferring suction to the residual heat removal sump during the recirculation phase of operation.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- a. With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours* or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected safety injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.

* The allowable outage time for each RHR train may be extended to 7 days for the purpose of maintenance and modification. This exception may only be used one time per RHR train and is not valid after December 31, 1997.

85. Given the following plant conditions:

- Mode 3.
- T_{AVG} 557°F, stable.
- Pressurizer level indications are as follows:
 - LI-459A 25%, stable.
 - LI-460 20%, stable.
 - LI-461 25%, stable.
- FCV-122, CHG FLOW controller is in AUTO, output is 36%, stable.

Which ONE of the following describes the status of the High Pressurizer Level trip **Functional Unit** and the **highest** plant Mode that can be attained in accordance which Technical Specifications if all applicable action statements **are satisfied**?

REFERENCE PROVIDED

- | | | |
|----|-------------|---------|
| A. | OPERABLE; | Mode 1. |
| B. | OPERABLE; | Mode 3. |
| C. | INOPERABLE; | Mode 2. |
| D. | INOPERABLE; | Mode 3. |

TABLE 3.3-1 (Continued)
REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
11. Pressurizer Water Level--High	3	2	2	1	6 [#]
12. A. Loss of Flow - Single Loop (Above P-8)	3/loop	2/loop in any oper- ating loop	2/loop in each oper- ating loop	1	6 [#]
B. Loss of Flow - Two Loops (Above P-7 and below P-8)	3/loop	2/loop in two oper- ating loops	2/loop each oper- ating loop	1	6 [#]
13. Steam Generator Water Level--Low-Low	3/loop	2/loop in any oper- ating loops	2/loop in each oper- ating loop	1, 2	6 [#]
14. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level	2/loop-level and 2/loop-flow mismatch in each loop	1/loop-level coincident with 1/loop-flow mismatch in same loop	1/loop-level and 2/loop-flow mismatch in same loop or 2/loop-level and 1/loop-flow mismatch in same loop	1, 2	6 [#]

TABLE 3.3-1 (Continued)

TABLE NOTATION

- * With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.
- # The provisions of Specification 3.0.4 are not applicable.
- ## Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint.
- ### Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.
- **** Values left blank pending NRC approval of 2 loop operation.

ACTION STATEMENTS

- ACTION 1 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours.
- ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
- a. The inoperable channel is placed in the tripped condition within 72 hours.
 - b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.
 - c. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

- ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:
- a. Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.
 - b. Above the P-6 (Intermediate Range Neutron Flux Interlock) setpoint but below 10 percent of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10 percent of RATED THERMAL POWER.
- ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement suspend all operations involving positive reactivity changes.
- ACTION 5 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.
- ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
- a. The inoperable channel is placed in the tripped condition within 72 hours; and
 - b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.
- ACTION 7 - With less than the Minimum Number of Channels OPERABLE, within one hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

86. Given the following plant conditions:

Time 0900:

- Mode 1
- Fuel movement in progress in the Fuel Handling Building.

Time 0930:

- Trembling felt in the Control Room.

Time 0935:

- XCP-638, 3-6, SEIS RCDR SYS START/ PWR LOSS in alarm.

Time 0955:

- XCP-608, 1-2, SFP LVL HI/LO in alarm.
- Fuel Handling Operators report that a fuel assembly was dropped and bubbles were observed rising from the assembly.
- RM-G8, SPENT FUEL POOL AREA Hi-rad alarm in, indication rising.
- RM-A6, FUEL HANDLING BLDG EXHAUST Hi-rad alarm in, indication rising.

Time 1000:

- XCP-638, 3-5, RB FOUND SEIS SWITCH OBE EXCEED in alarm.

Which ONE of the choices below completes the following:

The **earliest times** at which conditions were **met** for UE and ALERT classifications were _____ and _____.

Do **not** consider Emergency Director Judgment as a basis for emergency classification.

REFERENCE PROVIDED

	UE	ALERT
A.	0930	0955
B.	0930	1000
C.	0935	0955
D.	0935	1000

87. Given the following plant conditions:

Time 0100:

- All offsite power was lost (115 KV and 230 KV)
- Both EDGs **failed** to start.
- EOP-6.0, LOSS OF ALL ESF AC POWER, in progress.
- Operators are depressurizing Steam Generators.
- 1DA and 1DB indicate 0 VAC.

Time 0300:

- Core Exit Thermocouples 730°F, increasing.
- RVLIS Narrow Range 25%, decreasing.

Time 0315:

- Core Exit Thermocouples 1210°F, increasing.
- RVLIS Narrow Range 20%, decreasing.

Which ONE of the following identifies the earliest time that requires a transfer out of EOP-6.0 with 1DA and 1DB **still deenergized** and the procedure to which operators will transfer?

- A. At 0300 operators will transfer to EOP-14.0 RESPONSE TO INADEQUATE CORE COOLING.
- B. At 0300 operators will transfer to SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE.
- C. At 0315 operators will transfer to EOP-14.0 RESPONSE TO INADEQUATE CORE COOLING.
- D. At 0315 operators will transfer to SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE.

88. Given the following plant conditions:

Initial conditions:

- "A" CCW is the active loop.
- "C" Service Water pump is INOPERABLE.
- All offsite power was lost (115 KV and 230 KV).

Current conditions:

- Steam Generator (SG) Tube Rupture on "B" SG occurred.
- Operators have just completed the last step of EOP-4.0, STEAM GENERATOR TUBE RUPTURE.
- "B" SG NR level is 92%, stable.
- Steam Generator blowdown is not available.
- "A" Service Water Pump tripped and cannot be restarted.
- XCP-613, 1-2, DEMIN FLO DIVERT TEMP HI in alarm.

Which ONE of the choices below completes the following?:

The correct transfer out of EOP-4.0 is to

_____ (1) _____;

The guidance in AOP-117.1, LOSS OF SERVICE WATER, will be used

_____ (2) _____ to restore the active CCW loop.

- A. 1) EOP-4.1A, POST-SGTR COOLDOWN BY BACKFILLING THE REACTOR COOLANT SYSTEM;
2) in parallel with actions of EOP-4.1A
- B. 1) EOP-4.1A, POST-SGTR COOLDOWN BY BACKFILLING THE REACTOR COOLANT SYSTEM;
2) after recovery actions of EOP-4.1A are complete
- C. 1) EOP-4.1C, POST-SGTR COOLDOWN USING STEAM DUMP;
2) in parallel with actions of EOP-4.1C
- D. 1) EOP-4.1C, POST-SGTR COOLDOWN USING STEAM DUMP;
2) after recovery actions of EOP-4.1C are complete

89. Given the following plant conditions:

Time 2100, 8/25:

- Mode 1.
- Bus 1DA ALT FEED breaker has been declared INOPERABLE.

Time 0745, 8/26:

- "B" EDG is loaded in parallel with offsite sources for a Monthly Operability Test.
- Control power is lost to XSW1DB 10, EMERG DIESEL GEN B XEG0001B-DG.

Which ONE of the following describes the current OPERABILITY status of "B" EDG and a Technical Specification action that will be **required** due to the stated conditions?

- A. "B" EDG is OPERABLE;
Verify operability of offsite power sources.
- B. "B" EDG is OPERABLE;
Verify operability of the "A" Emergency Diesel.
- C. "B" EDG is **not** OPERABLE;
Verify operability of the Turbine-driven EFW pump.
- D. "B" EDG is **not** OPERABLE;
Make preparations to lower load within ONE (1) hour.

90. Given the following plant conditions:

- Spurious Reactor trip occurred.
- Operators were taking actions as directed by EOP-1.1, REACTOR TRIP RECOVERY.
- Plant fire in the cable spreading room was reported.
- FEP-4.0, CONTROL ROOM EVACUATION DUE TO FIRE is in progress.

Which ONE of the choices below completes both of the following?:

The CRS must transfer CREP switches to LOCAL within a **maximum** of _(1)___ minutes after entering FEP-4.0.

If it is determined that a loss of secondary heat sink occurs while in FEP-4.0, EOP-15.0, RESPONSE TO A LOSS OF SECONDARY HEAT SINK will be _____(2)_____.

- A. 1) 30
2) read by the CRS and each step will be executed concurrently with actions of FEP-4.0.
- B. 1) 42
2) read by the CRS and each step will be executed concurrently with actions of FEP-4.0.
- C. 1) 30
2) used as guidance **only** while in FEP-4.0.
- D. 1) 42
2) used as guidance **only** while in FEP-4.0.

91. Given the following plant conditions:

Initial conditions:

- 100% power initially.
- Earthquake occurred.
- RM-L1, RC LTDN HI RNG HI RAD goes into alarm.
- Steam Generator tube rupture occurred on "A" SG.
- EOP-4.0, STEAM GENERATOR TUBE RUPTURE in progress.
- Operators are performing a RCS cooldown.
- RM-G19B and C, MN STM LINE B (C) are rising.
- "B" EFW flow 200 gpm.
- "C" EFW flow 200 gpm.
- "B" NR SG level 57%, rising.
- "C" NR SG level 51%, lowering.

Which ONE of the choices below completes the following statements?

The basis for returning to Step 1 of EOP-4.0 for the current conditions is to

_____ (1) _____.

The new target temperature for cooldown will be based on the ____ (2) ____ ruptured Steam Generator pressure.

- A. 1) evaluate a transfer to EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.
2) highest
- B. 1) evaluate a Transfer to EOP-4.2, SGTR WITH LOSS OF REACTOR COOLANT: SUBCOOLED RECOVERY DESIRED.
2) lowest
- C. 1) re-perform Steam Generator isolation steps.
2) highest
- D. 1) re-perform Steam Generator isolation steps.
2) lowest

92. Given the following plant conditions:

- Mode 4
- RCS temperature is 325°F, stable.
- RM-A2, REACTOR BUILDING SAMPLE LINE MONITOR has been declared inoperable due to a detector failure at **2345, 8/19**.
- Manual leakrate calculations are being done to satisfy Surveillance 4.4.6.2.1.d in accordance with the associated action statement in T.S.3.4.6.1, REACTOR COOLANT SYSTEM LEAKAGE, LEAKAGE DETECTION SYSTEMS.
- The last calculation was performed at **0215, 8/20**.

Which ONE of the following describes the **latest** time for completion of the next leakrate calculation that will comply with Technical Specifications?

REFERENCE PROVIDED

- A. 2345, 8/20.
- B. 0215, 8/21.
- C. 0545, 8/21.
- D. 0815, 8/21.

REACTOR COOLANT SYSTEM

3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

LEAKAGE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.6.1 The following Reactor Coolant System leakage detection systems shall be OPERABLE:

- a. One reactor building sump level,
- b. One reactor building atmosphere radioactivity monitor (gaseous or particulate), and
- c. One reactor building cooling unit condensate flow rate monitor.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With the reactor building sump level monitor inoperable, perform surveillance requirement 4.4.6.2.1.d (Reactor Coolant System water inventory balance) at least once per 24 hours⁽¹⁾ and restore the required reactor building sump level monitor to OPERABLE status within 30 days; otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With the required reactor building atmosphere radioactivity monitor inoperable, analyze grab samples of the containment atmosphere at least once per 24 hours or perform surveillance requirement 4.4.6.2.1.d (Reactor Coolant System water inventory balance) at least once per 24 hours⁽¹⁾ and restore the required reactor building atmosphere radioactivity monitor to OPERABLE status or verify the reactor building cooling unit condensate flow rate monitor is OPERABLE within 30 days; otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With the reactor building cooling unit condensate flow rate monitor inoperable, perform a CHANNEL CHECK of the required reactor building atmosphere radioactivity monitor at least once per 8 hours or perform surveillance requirement 4.4.6.2.1.d (Reactor Coolant System water inventory balance) at least once per 24 hours⁽¹⁾; otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- d. With the reactor building sump level monitor and the reactor building cooling unit condensate flow rate monitor inoperable and with the reactor building atmosphere gaseous radioactivity monitor being the only remaining OPERABLE leakage

⁽¹⁾ Not required to be performed/completed until 12 hours after establishment of steady state operation.

93. Given the following plant conditions:

Time 1500:

- A fire in the Turbine Driven EFW Pump room was reported to the Control Room.
- The fire detector in the room **failed to detect the fire**.
- Automatic fire suppression failed to actuate.

Time 1520:

- The fire has been extinguished.
- The door to the Turbine Driven EFW Pump room is sprung from its frame and the surrounding wall is buckled due to fire-related damage.

Which ONE of the choices below answers both of the following:

- 1) What is the **highest** EAL declaration required for this event?
- 2) What type of door is the door to the Turbine Driven EFW Pump room?

REFERENCE PROVIDED

- A. 1) UE.
2) Fire Rated Assembly **only**.
- B. 1) UE.
2) Fire Rated Assembly **and** Steam Propagation Barrier.
- C. 1) Alert.
2) Fire Rated Assembly **only**.
- D. 1) Alert.
2) Fire Rated Assembly **and** Steam Propagation Barrier.

DOOR BARRIER TYPE LIST

Door Number	FRA*	Other
CB-102	X	SPB
CB-103	X	
CB-107A	X	
CB-108	X	
CB-133	X	
CB-134	X	
CB-135	X	
CB-201	X	
CB-202	X	
CB-203	X	
CB-301	X	SPB, CO ₂
CB-302	X	SPB
CB-303	X	
CB-304		CO ₂
CB-305	X	CO ₂
CB-307	X	
CB-308	X	CO ₂
CB-309	X	
CB-311	X	
CB-313		CO ₂
CB-314		CO ₂
CB-316		CO ₂
CB-317	X	CO ₂
CB-318		CO ₂
CB-319	X	CO ₂

Door Number	FRA*	Other
CB-401	X	CRP
CB-402	X	CRP
CB-403	X	
CB-404	X	
CB-405		CRP
CB-501	X	SPB
CB-502	X	
CB-503		CRP
CB-508	X	CRP
CB-512	X	
CB-513	X	CRP
CB-514	X	CRP
CB-516		CRP
CB-517	X	CRP
CB-601	X	
CB-603	X	
CB-604	X	
CB-605	X	SPB
AB-303A	X	SPB
AB-304A	X	SPB
AB-309A		SPB
AB-319	X	SPB
AB-401	X	SPB
AB-421	X	SPB
AB-501A	X	SPB
AB-514	X	SPB
AB-515		SPB

CHG
F

CHG
F

* All FRAs designated by an X are 10CFR50 Appendix R doors. Failure to meet acceptance criteria requires application of compensatory action.

DOOR BARRIER TYPE LIST

Door	FRA*	Other
RB-202	X	
PA-101	X	SPB
PA-102	X	SPB
PA-201	X	SPB
PA-202	X	SPB
PA-301	X	SPB
PA-302	X	SPB
RB-303	X	
DB-101	X	
DB-202	X	
DB-307	X	
DB-401	X	
IB-102	X	
IB-103	X	SPB#
IB-104	X	SPB
IB-105A	X##	SPB ###
IB-105B	X##	SPB ###
IB-106	X	
IB-107	X	SPB
IB-108	X	SPB
IB-109	X	
IB-110	X	SPB
IB-111	X	SPB

Door	FRA*	Other
IB-112	X	SPB
IB-113	X	SPB
IB-114	X	SPB
IB-115	X	SPB
IB-116	X	SPB
IB-117	X	
IB-118	X	
IB-119	X	
IB-201	X	
IB-202	X	SPB
IB-203	X	
IB-204	X	SPB
IB-207	X	
IB-208	X	
IB-209	X	
IB-210		SPB
IB-301	X	SPB
IB-302	X	
IB-304	X	
IB-305	X	SPB
IB-305A		SPB
IB-306	X	

CHG
E

* All FRAs designated by an X are 10CFR50 Appendix R doors. Failure to meet acceptance criteria requires application of compensatory action.

Door IB-103 may be opened / inoperable provided train separation has been established via closure of doors IB-105A & IB-105B, closure of HELB dampers XDP-5020-AH & XDP-5021-AH, and maintenance of water in the floor drain loop seal in room IB 36-03B.

Door opening IB-105 consists of two door leafs in series. Only one leaf (105A or 105B) is required to provide the fire rated function. Doors IB-105A and IB-105B are not required to be self-closing.

SPB function only required during work activities that require train separation. In those cases both IB-105A and IB-105B must be closed to provide SPB function.

CHG
E&G

DOOR BARRIER TYPE LIST

Door Number	FRA*	Other
IB-307	X	
IB-308	X	
IB-309	X	
IB-310	X	
IB-310A	X	
IB-310B	X	
IB-311	X	SPB
IB-312	X	
IB-313	X	
IB-314	X	
IB-315	X	SPB
IB-316	X	SPB
IB-317	X	SPB
IB-318	X	
IB-318A	X	
IB-319	X	

Door Number	FRA*	Other
IB-320	X	
IB-321	X	
IB-403	X	SPB
IB-406		SPB
IB-407	X	SPB
IB-408	X	SPB
IB-409	X	SPB
SW-101	X	
SW-102	X	
SW-103	X	
SW-104	X	
SW-203	X	
SW-302	X	
SW-303	X	
SW-304	X	
SW-305	X	
SW-306	X	

* All FRAs designated by an X are 10CFR50 Appendix R doors. Failure to meet acceptance criteria requires application of compensatory action.

94. Given the following plant conditions:

- Crew is preparing to start "C" RCP.
- Pressurizer level 94%.
- RCS T_{COLD} temperature is 192°F
- "C" Steam Generator Temperatures is 243°F

Which ONE the following identifies whether a start of "C" RCP is allowed in accordance with SOP-101, REACTOR COOLANT SYSTEM and the basis for evaluating steam generator temperatures and T_{COLD} temperatures prior to the start?

A. Start of "C" RCP is **not** allowed.

Ensures that the resulting pressure transient does not cause pressurized thermal shock.

B. Start of "C" RCP is **not** allowed.

Limits the RCS pressurization so that brittle fracture limits are not exceeded.

C. Start of "C" RCP is allowed.

Ensures that the resulting pressure transient does not cause pressurized thermal shock.

D. Start of "C" RCP is allowed.

Limits the RCS pressurization so that brittle fracture limits are not exceeded.

95. Given the following plant conditions:

- Date and time: **Monday** 8/5, 1945.
- The on-coming NROATC is running late but is expected at **2130**.
- The **off-going** NROATC has worked the following schedule :

NOTE: TIMES BELOW DO NOT INCLUDE TURNOVER TIME.

7/23 - 7/29, OFF

7/30, 0700 to 1900

7/31, 0700 to 2000

8/1, 0700 to 1800

8/2, 0700 to 1900

8/3, 1100 to 1800

8/4, OFF

8/5, began work at 0400

- **Only** the following personnel are present to perform Control Room duties:
 - On-coming Shift Supervisor
 - On-coming CRS
 - On-coming STA - (non-licensed).
 - Off-going** NROATC - (RO License).
 - On-coming BOP - (RO License).
- A power reduction is planned to start early in the next shift to comply with a Technical Specification action that requires the plant in Mode 3 by **Wednesday** 8/8, 1200.

Which ONE of the choices below completes the following statements in accordance with SAP-152, FATIGUE MANAGEMENT AND WORK HOUR LIMITS?

The off-going NROATC will reach the **first** 10 CFR 26 work hour limit at ___(1)___ .

A **valid** reason to authorize a work limit waiver for the off-going RO would be to ensure that _____(2)_____.

- A. 1) 2000.
2) shift staffing meets Technical Specification minimum requirements.
- B. 1) 2000.
2) the planned power reduction is not delayed.
- C. 1) 2100.
2) shift staffing meets Technical Specification minimum requirements.
- D. 1) 2100.
2) the planned power reduction is not delayed.

96. Given the following plant conditions:

- Mode 1
- Engineering is determining the risk for a planned maintenance activity in the Switchyard.

Which ONE of the choices below answers both of the following?:

- 1) What can be used as a determining factor for calculating EOOS Risk?
- 2) What position or group authorizes the start of work for an ORANGE risk activity?

- A. 1) Core Damage Frequency only.
2) General Manager Nuclear Plant Operations or Management Duty Supervisor.
- B. 1) Core Damage Frequency only.
2) Plant Safety Review Committee.
- C. 1) Core Damage Frequency or Large Early Release Frequency.
2) General Manager Nuclear Plant Operations or Management Duty Supervisor.
- D. 1) Core Damage Frequency or Large Early Release Frequency.
2) Plant Safety Review Committee.

97. Time 0730, 8/23:

- Mode 4.
- Plant cooldown in progress.
- "A" CCW train is the active train.
- A suspected maintenance problem on **only** CCW pump breakers will require a visual inspection of **each** breaker to determine OPERABILITY.
- "B" CCW Pump, is tagged out and racked down.
 - The "B" CCW pump breaker is visually inspected without any disassembly.
 - **No** defects are found on "B" CCW pump breaker.

Time 1030, 8/23:

- "B" CCW Pump is **racked up and tags are cleared.**
- "B" CCW Pump is test started and declared OPERABLE.

Time 1130, 8/23:

- Visual inspection of "A" and "C" CCW Pumps determines that they are **both** INOPERABLE.

Which ONE of the choices below answers both of the following:

- 1) Was the test start of "B" CCW pump at Time 1030 required to establish OPERABILITY of that pump?
- 2) When is the **latest** time by which the plant must be in Mode 5?

REFERENCE PROVIDED

	(1)	(2)
A.	Yes.	1730, 8/24.
B.	No.	1730, 8/24.
C.	Yes.	1730, 8/27.
D.	No.	1730, 8/27.

PLANT SYSTEMS

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3 At least two independent component cooling water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.3 At least two component cooling water loops shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

98. Given the following plant conditions:

Time 0900, 8/20/13.

- Waste Gas Decay Tank "H" sampled.
- A Release Permit was approved for a release of Waste Gas Decay Tank (WGDT) "H".

Time 0945, 8/20/13.

- Wind direction From the South.
- Release was commenced.
- HCV-014, WASTE GAS DISCHARGE CONTROL VALVE **went closed** due to a leak on the valve operator diaphragm.

Time 0200, 8/21/13:

- HCV-014 has been repaired.
- RM-A3 reading Normal background.
- Wind direction From the West-Southwest.

Which ONE of the choices below answers both of the following?:

- 1) Is a **new** release permit required to reestablish the release at 0200?
- 2) Is a release allowed with the current wind direction?

A. 1) No.
2) Yes.

B. 1) No.
2) No.

C. 1) Yes.
2) Yes.

D. 1) Yes.
2) No.

99. Given the following plant conditions:

Time 1203:

- 100% power.
- The plant has been in Mode 1 for the last seven months.
- Anti-nuclear protesters were gathered at the guard post.
- One person was seen running past the gate carrying a pistol and backpack and climbing over the rock barrier.

Time 1205.

- Security observed the same person jump over the fence and run past Warehouse C.

Time 1216.

- A loud explosion was heard in the Control Room.

Time 1228.

- Spent Fuel Pool level LI-7431/ 7433 reads offscale low.

Time 1235.

- RM-A13, MAIN PLANT VENT EXHAUST reads 15 mr/hr, rising.

Which ONE of the choices contains the times at which conditions were **first** met for declaration of Site Area Emergency and General Emergency?

Do **not** consider Emergency Director Judgment as a basis for emergency classification

REFERENCE PROVIDED

	SAE	GE
A.	1203	1228
B.	1203	1235
C.	1205	1228
D.	1205	1235

100. Given the following plant conditions:

- Large Break LOCA occurred.
- An ALERT was declared at 1500.
- A release is occurring due to a small breach in the Reactor Building Equipment Hatch.
- A Site Area Emergency was declared at 1530.


Which ONE of the choices below answers **both** of the following:

In accordance with EPP-012, ONSITE PERSONNEL ACCOUNTABILITY AND EVACUATION;

- 1) What is the **lowest** EAL declaration level at which Evacuation/ Accountability is required?
 - 2) What is the location to which Non-Essential personnel will be directed by the IED for evacuation?
- A. 1) Alert.
2) Non-essential personnel will be directed to their personal residences.
- B. 1) Site Area Emergency.
2) Non-essential personnel will be directed to their personal residences.
- C. 1) Alert.
2) Non-essential personnel will be directed to an Offsite Holding Area.
- D. 1) Site Area Emergency.
2) Non-essential personnel will be directed to an Offsite Holding Area.

		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT																																																																																																	
R	1 Offsite Rad Conditions	<p>Offsite dose resulting from an actual or imminent release of gaseous radioactivity greater than 1000 mRem TEDE or 5000 mRem thyroid CDE for the actual or projected duration of the release using actual meteorology</p> <p>RG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Valid reading on any monitors that exceeds or is expected to exceed Table R-1 column "GE" for ≥ 15 min. (Note 1)</p> <p>RG1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Dose assessment using actual meteorology indicates doses > 1,000 mRem TEDE or 5,000 mRem thyroid CDE at or beyond the site boundary</p> <p>RG1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Field survey results indicate closed window dose rates > 1,000 mRem/hr expected to continue for ≥ 1 hr at or beyond the site boundary</p> <p>OR</p> <p>Analyses of field survey samples indicate thyroid CDE of > 5,000 mRem for 1 hr of inhalation at or beyond the site boundary</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	<p>Offsite dose resulting from an actual or imminent release of gaseous radioactivity greater than 100 mRem TEDE or 500 mRem thyroid CDE for the actual or projected duration of the release</p> <p>RS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Valid reading on any radiation monitors that exceeds or is expected to exceed Table R-1 column "SAE" for ≥ 15 min. (Note 1)</p> <p>RS1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Dose assessment using actual meteorology indicates doses > 100 mRem TEDE or 500 mRem thyroid CDE at or beyond the site boundary</p> <p>RS1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Field survey indicates closed window dose rate > 100 mRem/hr that is expected to continue for ≥ 1 hr at or beyond the site boundary</p> <p>OR</p> <p>Field survey sample analysis indicates thyroid CDE of > 500 mRem for 1 hr of inhalation at or beyond the site boundary</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	<p>Any release of gaseous or liquid radioactivity to the environment greater than 200 times the radiological effluent Offsite Dose Calculation Manual (ODCM) limits for 15 minutes or longer</p> <p>RA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Valid reading on any Gaseous monitors > Table R-1 column "Alert" for ≥ 15 min. (Note 2)</p> <p>RA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Valid reading on Liquid monitor RM-L9 > Table R-1 column "Alert" for ≥ 15 min. (Note 2)</p> <p>RA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates > 200 x ODCM limits for ≥ 15 min. (Note 2)</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	<p>Any release of gaseous or liquid radioactivity to the environment greater than 2 times the radiological effluent Offsite Dose Calculation Manual (ODCM) limits for 60 minutes or longer</p> <p>RU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Valid reading on any Gaseous monitors > Table R-1 column "UE" for ≥ 60 min. (Note 2)</p> <p>RU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Valid reading on Liquid monitor RM-L9 > Table R-1 column "UE" for ≥ 60 min. (Note 2)</p> <p>RU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates > 2 x ODCM limits for ≥ 60 min. (Note 2)</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF													
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2 Abnormal Rad Release / Rad Effluent	<table><tr><th colspan="7">Table R-1 Effluent Monitor Classification Thresholds</th></tr><tr><th></th><th>Release Point</th><th>Monitor</th><th>GE</th><th>SAE</th><th>Alert</th><th>UE</th></tr><tr><td rowspan="4">Gaseous</td><td rowspan="2">Main Plant Vent Exhaust</td><td>RM-A3 (gas)</td><td>N/A</td><td>2.8E5 cpm</td><td>200 x Hi Rad alarm</td><td>2 X Hi-Rad alarm</td></tr><tr><td>RM-A13</td><td>14 mR/hr</td><td>N/A</td><td>N/A</td><td>N/A</td></tr><tr><td rowspan="2">RB Purge Exhaust</td><td>RM-A4 (gas)</td><td>N/A</td><td>N/A</td><td>200 x Hi Rad alarm*</td><td>2 X Hi-Rad alarm*</td></tr><tr><td>RM-A14</td><td>740 mR/hr*</td><td>74 mR/hr*</td><td>N/A</td><td>N/A</td></tr><tr><td>Main Steam Line</td><td>RM-G19 A/B/C</td><td>535 mR/hr**</td><td>53.5 mR/hr**</td><td>5.4 mR/hr**</td><td>N/A</td></tr><tr><td>Liquid</td><td>Liquid Waste and Nuclear Blowdown Discharge</td><td>RM-L9</td><td>N/A</td><td>N/A</td><td>200 X Hi-Rad alarm*</td><td>2 X Hi-Rad alarm*</td></tr><tr><td colspan="7">* With effluent discharge not isolated ** During a tube rupture with reactor at power RM-G19A/B/C monitor readings are affected by N¹⁶ gamma therefore they are not reliable until reactor has tripped and the monitors are stable.</td></tr><tr><td colspan="3">None</td><td colspan="4">None</td></tr></table>	Table R-1 Effluent Monitor Classification Thresholds								Release Point	Monitor	GE	SAE	Alert	UE	Gaseous	Main Plant Vent Exhaust	RM-A3 (gas)	N/A	2.8E5 cpm	200 x Hi Rad alarm	2 X Hi-Rad alarm	RM-A13	14 mR/hr	N/A	N/A	N/A	RB Purge Exhaust	RM-A4 (gas)	N/A	N/A	200 x Hi Rad alarm*	2 X Hi-Rad alarm*	RM-A14	740 mR/hr*	74 mR/hr*	N/A	N/A	Main Steam Line	RM-G19 A/B/C	535 mR/hr**	53.5 mR/hr**	5.4 mR/hr**	N/A	Liquid	Liquid Waste and Nuclear Blowdown Discharge	RM-L9	N/A	N/A	200 X Hi-Rad alarm*	2 X Hi-Rad alarm*	* With effluent discharge not isolated ** During a tube rupture with reactor at power RM-G19A/B/C monitor readings are affected by N ¹⁶ gamma therefore they are not reliable until reactor has tripped and the monitors are stable.							None			None				<p>Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the Reactor Vessel</p> <p>RA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>A water level drop in the reactor refueling cavity, spent fuel pool or fuel transfer canal that will result in irradiated fuel becoming uncovered</p> <p>RA2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>A valid Hi-Rad alarm on any of the following due to damage to irradiated fuel or loss of water level:</p> <ul style="list-style-type: none">RM-G6 Rx Bldg Refueling BridgeRM-G17A/B Rx Bldg Manipulator CraneRM-G8 Spent Fuel Pool AreaRM-A6 Fuel Handling Bldg Exhaust <p>Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions</p> <p>RA2.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Dose rates > 15 mR/hr in areas requiring continuous occupancy to maintain plant safety functions:</p> <p>Control Room (RM-G1)</p> <p>OR</p> <p>CAS (by survey)</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	<p>Unplanned rise in plant radiation levels</p> <p>RU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Unplanned water level drop in the refueling cavity, spent fuel pool or fuel transfer canal as indicated by any of the following:</p> <ul style="list-style-type: none">Refueling Cavity: LI-7403 MCB annunciator XCP-609 2-6 (REFUEL CAV LVL HI/LO)Spent Fuel Pool: LI-7431 and LI-7433 MCB annunciators XCP 608(609) 1-2 (SFP LVL HI/ LO)Fuel Transfer Canal: LI-7405 MCB annunciator XCP-612 1-6 (FUEL XFER CANAL LVL HI/LO) <p>AND</p> <p>Valid area radiation monitor reading rise on any of the following:</p> <ul style="list-style-type: none">RM-G6 Rx Bldg Refueling BridgeRM-G17A/B Rx Bldg Manipulator CraneRM-G8 Spent Fuel Pool Area <p>RU2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Unplanned valid area radiation monitor readings or survey results indicate a rise by a factor of 1000 over normal* levels</p> <p>* Normal levels can be considered as the highest reading in the past 24 hours excluding the current peak value</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
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H	1 Natural & Destructive Phenomena	<p>Notes</p> <p>Note 1: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results</p> <p>Note 2: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</p> <p>Note 3: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</p> <p>Note 4: If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.</p>	<div><div>Table H-1 Vital Areas</div><div><ul style="list-style-type: none">- Reactor Building- Auxiliary Building- Control Building- Fuel Handling Building- Intermediate Building- Diesel Generator Building- Turbine Building- Service Water Pumphouse- Safe Shutdown Yard Areas:<ul style="list-style-type: none">• RWST• CST• DG Fuel Oil Storage• Electrical Manhole #2</div></div> <div><div>Table H-2 Flooding Areas</div><div><ul style="list-style-type: none">- Auxiliary Building- Control Building- Fuel Handling Building- Intermediate Building- Diesel Generator Building- Service Water Pumphouse</div></div>	<p>Natural and destructive phenomena affecting the plant Vital Area</p> <p>HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Seismic event > OBE as indicated by activation of EITHER:</p> <ul style="list-style-type: none">Triaxial Seismic Switch MCB annunciator XCP-638 3-5 (RB FOUND SEIS SWITCH OBE EXCEED)Any red OBE light on the Triaxial Response Spectrum Recorder <p>AND</p> <p>Earthquake confirmed by any of the following:</p> <ul style="list-style-type: none">Earthquake felt in plantNational Earthquake Information CenterControl Room indication of degraded performance of systems required for the safe shutdown of the plant <p>HA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Tornado striking or sustained high winds > 100 mph resulting in EITHER:</p> <ul style="list-style-type: none">Visible damage to any Table H-1 structures containing safety systems or componentsControl Room indication of degraded performance of those systems <p>HA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Vehicle crash resulting in EITHER:</p> <ul style="list-style-type: none">Visible damage to any Table H-1 structures containing safety systems or componentsControl Room indication of degraded performance of those safety systems <p>HA1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Turbine failure-generated projectiles resulting in EITHER:</p> <ul style="list-style-type: none">Visible damage to or penetration of any Table H-1 structures containing safety systems or componentsControl Room indication of degraded performance of those safety systems <p>HA1.5 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Internal flooding in any Table H-2 Flooding Areas resulting in EITHER:</p> <ul style="list-style-type: none">An electrical shock hazard that precludes access to operate or monitor safety equipmentControl Room indication of degraded performance of those safety systems	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	<p>Natural and destructive phenomena affecting the Protected Area</p> <p>HU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Seismic event identified by two or more of the following:</p> <ul style="list-style-type: none">Activation of Seismic Instrument Event Indicator MCB annunciator XCP-638 3-6 (SEIS RCDR SYS START/PWR LOSS)Earthquake felt in plantNational Earthquake Information Center <p>HU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Tornado striking within the Protected Area boundary</p> <p>OR</p> <p>Sustained high winds > 100 mph</p> <p>HU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Turbine failure resulting in casing penetration or damage to turbine or generator seals</p> <p>HU1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Internal flooding that has the potential to affect safety-related equipment required by Technical Specifications for the current operating mode in any Table H-2 Flooding Areas</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
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2 Fire or Explosion	<div>None</div>	<div>None</div>	<p>Fire or explosion affecting the operability of plant safety systems required to establish or maintain safe shutdown</p> <p>HA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Fire or explosion resulting in EITHER:</p> <ul style="list-style-type: none">Visible damage to any Table H-1 plant structures containing safety systems or componentsControl Room indication of degraded performance of those safety systems	1	2	3	4	5	6	DEF	<p>Fire within the Protected Area not extinguished within 15 min. of detection or explosion within the Protected Area</p> <p>HU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Fire not extinguished within 15 min. (Note 3) of Control Room notification or verification of a Control Room fire alarm in any Table H-1 area</p> <p>HU2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Explosion within the Protected Area</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF																																											
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3 Hazardous Gas	<div>None</div>	<div>None</div>	<p>Access to a Vital Area is prohibited due to release of toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of systems required to maintain safe operations or safely shut down the reactor</p> <p>HA3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Access to a Vital Area is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of systems required to maintain safe operations or safely shut down the reactor (Note 4)</p>	1	2	3	4	5	6	DEF	<p>Release of toxic, corrosive, asphyxiant or flammable gases deemed detrimental to normal plant operation</p> <p>HU3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect normal plant operations</p> <p>HU3.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Report by local, county or state officials to evacuate or shelter site personnel based on offsite event</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF																																											
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1	2	3	4	5	6	DEF																																																														
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4 Security	<p>Hostile action resulting in loss of physical control of the facility</p> <p>HG4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>A hostile action has occurred such that plant personnel are unable to operate equipment required to maintain any of the following safety functions:</p> <ul style="list-style-type: none">Reactivity controlRCS inventorySecondary heat removal <p>HG4.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>A hostile action has caused failure of Spent Fuel Cooling systems</p> <p>AND</p> <p>Imminent fuel damage is likely for a freshly off-loaded reactor core in pool</p>	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	<p>Hostile action within the Protected Area</p> <p>HS4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>A hostile action is occurring or has occurred within the Protected Area as reported by the security Team Leader</p>	1	2	3	4	5	6	DEF	<p>Hostile action within the Owner Controlled Area or airborne attack threat</p> <p>HA4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>A hostile action is occurring or has occurred within the Owner Controlled Area as reported by the security Team Leader</p> <p>OR</p> <p>A validated notification from NRC of an airliner attack threat within 30 min. of the site</p>	1	2	3	4	5	6	DEF	<p>Confirmed security condition or threat which indicates a potential degradation in the level of safety of the plant</p> <p>HU4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>A security condition that does not involve a hostile action as reported by the security Team Leader</p> <p>OR</p> <p>A credible site-specific security threat notification</p> <p>OR</p> <p>A valid notification from NRC providing information of an aircraft threat</p>	1	2	3	4	5	6	DEF																													
1	2	3	4	5	6	DEF																																																														
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1	2	3	4	5	6	DEF																																																														
1	2	3	4	5	6	DEF																																																														
5 Control Room Evacuation	<div>None</div>	<p>Control Room evacuation has been initiated and plant control cannot be established</p> <p>HS5.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Control Room evacuation has been initiated</p> <p>AND</p> <p>Control of the plant cannot be established within 15 min.</p>	1	2	3	4	5	6	DEF	<p>Control Room evacuation has been initiated</p> <p>HA5.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>AOP-600.1, Control Room Evacuation, or FEP-4.0, Control Room Evacuation Due To Fire, requires Control Room evacuation</p>	1	2	3	4	5	6	DEF	<div>None</div>																																																		
1	2	3	4	5	6	DEF																																																														
1	2	3	4	5	6	DEF																																																														
6 Emergency Director Judgment	<p>Other conditions existing that in the judgment of the Emergency Director warrant declaration of General Emergency</p> <p>HG6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels (1 Rem TEDE and 5 Rem thyroid CDE) offsite for more than the immediate site area.</p>	1	2	3	4	5	6	DEF	<p>Other conditions existing that in the judgment of the Emergency Director warrant declaration of Site Area Emergency</p> <p>HS6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels (1 Rem TEDE and 5 Rem thyroid CDE) beyond the site boundary.</p>	1	2	3	4	5	6	DEF	<p>Other conditions existing that in the judgment of the Emergency Director warrant declaration of an Alert</p> <p>HA6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of hostile action. ANY releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels (1 Rem TEDE and 5 Rem thyroid CDE).</p>	1	2	3	4	5	6	DEF	<p>Other conditions existing that in the judgment of the Emergency Director warrant declaration of a UE</p> <p>HU6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table></p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs</p>	1	2	3	4	5	6	DEF																																				
1	2	3	4	5	6	DEF																																																														
1	2	3	4	5	6	DEF																																																														
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Modes: <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr><tr><td>Power Operations</td><td>Startup</td><td>Hot Standby</td><td>Hot Shutdown</td><td>Cold Shutdown</td><td>Refueling</td><td>Defueled</td></tr></table>							1	2	3	4	5	6	DEF	Power Operations	Startup	Hot Standby	Hot Shutdown	Cold Shutdown	Refueling	Defueled		<p>EPP-001, Attachment I, Rev.30A EAL Classification Matrix Page 1 of 3</p> <p>ALL CONDITIONS</p>
1	2	3	4	5	6	DEF																
Power Operations	Startup	Hot Standby	Hot Shutdown	Cold Shutdown	Refueling	Defueled																

		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT																																									
S System Malfunc.	1 Loss of Power	<p>Prolonged loss of all offsite and all onsite AC power to ESF buses</p> <p>SG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Loss of all offsite and all onsite AC power to 7.2 KV ESF buses 1DA and 1DB (Table S-3) AND EITHER: Restoration of at least one ESF bus within 4 hours is not likely OR CSFST Core Cooling-RED or ORANGE path</p>	1	2	3	4				<p>Loss of all offsite power and all onsite AC power to ESF buses for ≥ 15 min.</p> <p>SS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Loss of all offsite and all onsite AC power to 7.2 KV ESF buses 1DA and 1DB for ≥ 15 min. (Note 3) (Table S-3)</p> <p>Loss of all vital DC power for ≥ 15 min.</p> <p>SS1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>< 108 VDC on both Train A and Train B vital 125 VDC systems for ≥ 15 min. (Note 3)</p>	1	2	3	4				1	2	3	4				<p>AC power capability to ESF buses reduced to a single power source for ≥ 15 min. such that any additional single failure would result in station blackout</p> <p>SA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>AC power capability to 7.2 KV ESF buses 1DA and 1DB reduced to a single power source for ≥ 15 min. (Note 3) AND Any additional single power source failure will result in loss of all AC power to both 7.2 KV ESF buses (Table S-3)</p>	1	2	3	4				<p>Loss of all offsite power to ESF buses for ≥ 15 min.</p> <p>SU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Loss of all offsite AC power to 7.2 KV ESF buses 1DA and 1DB for ≥ 15 min. (Note 3) (Table S-3)</p>	1	2	3	4									
	1	2	3	4																																										
	1	2	3	4																																										
	1	2	3	4																																										
	1	2	3	4																																										
	1	2	3	4																																										
2 Criticality & RTS Failure	<p>Failure of the Reactor Trip System to complete an automatic trip and manual trip was not successful and there is indication of an extreme challenge to the ability to cool the core</p> <p>SG2.1 <table><tr><td>1</td><td>2</td><td></td><td></td><td></td><td></td><td></td></tr></table></p> <p>Automatic and all manual trips were not successful AND Reactor power is ≥ 5% AND EITHER: CSFST Core Cooling-RED OR CSFST Heat Sink-RED</p>	1	2						<p>Automatic Trip fails to shutdown the reactor and the manual actions taken from the reactor control console are not successful in shutting down the reactor</p> <p>SS2.1 <table><tr><td>1</td><td>2</td><td></td><td></td><td></td><td></td><td></td></tr></table></p> <p>Automatic trip was not successful after any RTS setpoint is exceeded. AND Manual actions taken at the reactor control console do not shutdown the reactor as indicated by reactor power ≥5%.</p> <p>Note: For manual actions, the reactor trip switches on XCP-6110/6114 are the only methods applicable to EAL SS2.1</p>	1	2						<p>Automatic Trip fails to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor</p> <p>SA2.1 <table><tr><td>1</td><td>2</td><td></td><td></td><td></td><td></td><td></td></tr></table></p> <p>Automatic trip was not successful after any RTS setpoint is exceeded AND Manual actions taken at the reactor control consoles successfully shutdown the reactor as indicated by reactor power <5%.</p> <p>Note: For manual actions, the reactor trip switches on XCP-6110/6114 are the only methods applicable to EAL SA2.1</p>	1	2						<p>Inadvertent criticality</p> <p>SU2.1 <table><tr><td></td><td></td><td></td><td>3</td><td>4</td><td></td><td></td></tr></table></p> <p>Any unplanned sustained positive startup rate observed on nuclear instrumentation</p>				3	4																
1	2																																													
1	2																																													
1	2																																													
			3	4																																										
3 Inability to Reach or Maintain Shutdown Conditions	<table><tr><th colspan="2">Table S-3 AC Power Supplies</th></tr><tr><td>Offsite:</td><td><ul style="list-style-type: none">- 115 KV power to XTF-4 and XTF-5- 230 KV power to XTF-31- Parr Hydro Plant 13.8 KV power to ESF Bus 1DA or 1DB</td></tr><tr><td>Onsite:</td><td><ul style="list-style-type: none">- Diesel Generator A- Diesel Generator B</td></tr></table>	Table S-3 AC Power Supplies		Offsite:	<ul style="list-style-type: none">- 115 KV power to XTF-4 and XTF-5- 230 KV power to XTF-31- Parr Hydro Plant 13.8 KV power to ESF Bus 1DA or 1DB	Onsite:	<ul style="list-style-type: none">- Diesel Generator A- Diesel Generator B	<p>None</p>	<p>None</p>	<p>Inability to reach required shutdown within Technical Specification limits</p> <p>SU3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Plant is not brought to required operating mode within Technical Specifications LCO action statement time</p>	1	2	3	4																																
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Offsite:	<ul style="list-style-type: none">- 115 KV power to XTF-4 and XTF-5- 230 KV power to XTF-31- Parr Hydro Plant 13.8 KV power to ESF Bus 1DA or 1DB																																													
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1	2	3	4																																											
4 Inst. / Comm.	<table><tr><th colspan="2">Table S-1 Significant Transients</th></tr><tr><td></td><td><ul style="list-style-type: none">- Electrical load rejection > 25% full electrical load- Reactor Trip- Runback > 25% thermal power- ECCS injection- Thermal power oscillations > 10%</td></tr></table>	Table S-1 Significant Transients			<ul style="list-style-type: none">- Electrical load rejection > 25% full electrical load- Reactor Trip- Runback > 25% thermal power- ECCS injection- Thermal power oscillations > 10%	<p>Inability to monitor a significant transient in progress</p> <p>SS4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Loss of approximately 75% of MCB annunciators associated with safety systems for ≥ 15 min. (Note 3) AND Any significant transient is in progress, Table S-1 AND Compensatory indications are unavailable</p>	1	2	3	4				<p>Unplanned loss of safety system annunciation or indication in Control Room with either (1) a significant transient in progress, or (2) compensatory indicators are unavailable</p> <p>SA4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Unplanned loss of approximately 75% of MCB annunciators or indicators associated with safety systems for ≥ 15 min. (Note 3) AND EITHER: Any significant transient is in progress, Table S-1 OR Compensatory indications are unavailable</p>	1	2	3	4				<p>Unplanned loss of most safety system annunciation or indication in the control room for > 15 min.</p> <p>SU4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Unplanned loss of approximately 75% of MCB annunciators or indicators associated with safety systems for ≥ 15 min. (Note 3)</p> <p>Loss of all onsite or offsite communications capabilities</p> <p>SU4.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Loss of all Table S-2 onsite (internal) communication methods affecting the ability to perform routine operations OR Loss of all Table S-2 offsite (external) communication methods affecting the ability to perform offsite notifications</p>	1	2	3	4				1	2	3	4													
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1	2	3	4																																											
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1	2	3	4																																											
5 Fuel Clad Degradation	<p>None</p>	<table><tr><th colspan="3">Table S-2 Communications Systems</th></tr><tr><th>System</th><th>Onsite (internal)</th><th>Offsite (external)</th></tr><tr><td>- Gai-Tronics system</td><td>X</td><td></td></tr><tr><td>- Radio system</td><td>X</td><td></td></tr><tr><td>- Internal telephone system</td><td>X</td><td></td></tr><tr><td>- Telephone land lines</td><td>X</td><td>X</td></tr><tr><td>- Fiberoptic links</td><td></td><td>X</td></tr><tr><td>- Satellite phone system</td><td></td><td>X</td></tr><tr><td>- Federal Telephone System</td><td></td><td>X</td></tr></table>	Table S-2 Communications Systems			System	Onsite (internal)	Offsite (external)	- Gai-Tronics system	X		- Radio system	X		- Internal telephone system	X		- Telephone land lines	X	X	- Fiberoptic links		X	- Satellite phone system		X	- Federal Telephone System		X	<p>None</p>	<p>None</p>	<p>Fuel clad degradation</p> <p>SU5.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>With letdown in service, RM-L1 high range monitor > 3.9E4 cpm</p> <p>SU5.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Coolant activity > any of the following:</p> <ul style="list-style-type: none">• Dose equivalent I-131 coolant activity > 1.0 µCi/gm for > 48 hours during one continuous time interval• Gross specific activity ≥ 100/E µCi/gm• Dose equivalent I-131 coolant activity in the unacceptable region of Technical Specifications Figure 3.4-1	1	2	3	4				1	2	3	4			
Table S-2 Communications Systems																																														
System	Onsite (internal)	Offsite (external)																																												
- Gai-Tronics system	X																																													
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- Satellite phone system		X																																												
- Federal Telephone System		X																																												
1	2	3	4																																											
1	2	3	4																																											
6 RCS Leakage	<p>None</p>	<p>None</p>	<p>Note: See Table F-1, Fission Product Barrier Matrix, for possible escalation above the Unusual Event due to RCS Leakage</p>	<p>RCS leakage</p> <p>SU6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Unidentified or pressure boundary leakage > 10 gpm OR Identified leakage > 25 gpm</p>	1	2	3	4																																						
1	2	3	4																																											
F Fission Product Barriers	<p>FG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Loss of any two barriers AND Loss or potential loss of third barrier (Table F-1)</p>	1	2	3	4				<p>FS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Loss or potential loss of any two barriers (Table F-1)</p>	1	2	3	4				<p>FA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Any loss or any potential loss of either Fuel Clad or RCS (Table F-1)</p>	1	2	3	4				<p>FU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td></tr></table></p> <p>Any loss or any potential loss of Containment (Table F-1)</p>	1	2	3	4																	
1	2	3	4																																											
1	2	3	4																																											
1	2	3	4																																											
1	2	3	4																																											

Table F-1 Fission Product Barrier Matrix							
	Fuel Clad Barrier		Reactor Coolant System Barrier		Containment Barrier		
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss	
A. Critical Safety Function Status	1. CSFST Core Cooling- RED	1. CSFST Core Cooling- ORANGE OR CSFST Heat Sink- RED and heat sink required	None	1. CSFST RCS Integrity- RED OR CSFST Heat Sink- RED and heat sink required	None	1. CSFST Containment- RED	
B. Core Exit TCs	2. Core exit TCs > 1,200°F	2. Core exit TCs > 700°F	None	None	None	2. Core exit TCs > 1,200°F AND Restoration procedures not effective within 15 min. 3. All of the following: <ul style="list-style-type: none">• Core exit TCs > 700°F• Reactor Vessel water level < Table F-2 thresholds• Restoration procedures not effective within 15 min.	
C. Radiation	3. RM-G7 or RM-G18 > 2 x 10 ³ R/hr	None	1. RM-G7 or RM-G18 > 4 x 10 ² R/hr	None	None	4. RM-G7 or RM-G18 > 2 x 10 ⁴ R/hr	
D. Inventory	None	3. Reactor Vessel water level < Table F-2 thresholds	2. RCS leak rate > available makeup capacity as indicated by a loss of RCS subcooling 3. Ruptured SG results in an ECCS (SI) actuation	2. Unisolable RCS leak exceeding the capacity of one charging pump in the normal charging mode	1. Containment pressure rise followed by a rapid unexplained drop in Containment pressure 2. Following LOCA, Containment pressure or sump level response not consistent with LOCA conditions 3. Ruptured SG is also faulted outside of Containment 4. Primary-to-secondary leakrate > 10 gpm AND Unisolable steam release from affected SG to the environment	5. Containment pressure > 57 psig and rising 6. Containment hydrogen concentration > 4% 7. Containment pressure > 12 psig AND < one full train of depressurization equipment operating Note: One full train of depressurization equipment is any of the following: <ul style="list-style-type: none">- 2 RBCU groups- 2 Containment Sprays- 1 RBCU group and 1 Containment Spray	
E. Other	4. Dose equivalent I-131 coolant activity > 300 µCi/gm	None	None	None	5. Failure of all valves in any one line to close AND Direct downstream pathway to the environment exists after Containment isolation signal	None	
F. Judgment	5. Any condition in the opinion of the Emergency Director that indicates loss of the Fuel Clad barrier	4. Any condition in the opinion of the Emergency Director that indicates potential loss of the Fuel Clad barrier	4. Any condition in the opinion of the Emergency Director that indicates loss of the RCS barrier	3. Any condition in the opinion of the Emergency Director that indicates potential loss of the RCS barrier	6. Any condition in the opinion of the Emergency Director that indicates loss of the Containment barrier	8. Any condition in the opinion of the Emergency Director that indicates potential loss of the Containment barrier	

Table F-2 Reactor Vessel Water Level Thresholds	
Number of RCPs Running	Fuel Clad and Containment Potential Loss
None	40% RVLIS Narrow Range
3	54% RVLIS Wide Range
2	27% RVLIS Wide Range
1	19% RVLIS Wide Range

- Note 1:**
The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results
- Note 2:**
The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.
- Note 3:**
The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.
- Note 4:**
If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.

Modes:

1

2

3


4

5

6

DEF

Power OperationsStartupHot StandbyHot ShutdownCold ShutdownRefuelingDefueled



EPP-001, Attachment I, Rev. 30A
EAL Classification Matrix
Page 2 of 3

HOT CONDITIONS
RCS > 200°F)

		GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		UNUSUAL EVENT												
C Cold SD/ Refuel System Malfunct.	1 Loss of Power	None		<div>Table C-5 AC Power Supplies</div> <div>Offsite: - 115 KV power to XTF-4 and XTF-5 - 230 KV power to XTF-31 - Parr Hydro Plant 13.8 KV power to ESF Bus 1DA or 1DB Onsite: - Diesel Generator A - Diesel Generator B</div>		None		None												
	2 RCS Level	Loss of Reactor Vessel inventory affecting fuel clad integrity with Containment challenged CG2.1 <div></div> Reactor Vessel level < top of active fuel (427' elevation, 57.9% RVLIS Narrow Range) for ≥ 30 min. (Note 3) <u>AND</u> Any Containment Challenge indication, Table C-4 CG2.2 <div></div> Reactor Vessel level cannot be monitored with core uncovery indicated by any of the following for ≥ 30 min. (Note 3): <ul style="list-style-type: none">RM-G6 or RM-G17A/B offscale-highErratic source range monitor indicationUnexplained rise in any Table C-1 sump / tank level <u>AND</u> Any Containment Challenge indication, Table C-4		Loss of Reactor Vessel inventory affecting core decay heat removal capability CS2.1 <div></div> With Containment closure not established, Reactor Vessel level > 6" below the bottom of the hot leg penetration (429' elevation, 62.9% RVLIS Narrow Range) CS2.2 <div></div> With Containment closure established, Reactor Vessel level < top of active fuel (427' elevation, 57.9% RVLIS Narrow Range) CS2.3 <div></div> Reactor Vessel level cannot be monitored for ≥ 30 min. (Note 3) with a loss of Reactor Vessel inventory as indicated by any of the following: <ul style="list-style-type: none">RM-G6 or RM-G17A/B offscale-highErratic source range monitor indicationUnexplained rise in any Table C-1 sump / tank level		Loss of RCS inventory CA2.1 <div></div> Reactor Vessel level < bottom of hot leg penetration (429'-6" elevation, 64.2% RVLIS Narrow Range) <u>OR</u> Reactor Vessel level cannot be monitored for ≥ 15 min. (Note 3) with unexplained rise in any Table C-1 sump / tank level		Unplanned loss of RCS inventory, RCS leakage CU2.1 <div></div> RCS leakage results in the inability to maintain or restore EITHER of the following for ≥ 15 min. (Note 3): <ul style="list-style-type: none">Pressurizer level > 17%Above the low end of the target level control band (If pressurizer level was intentionally lowered < 17%) CU2.2 <div></div> Unplanned RCS level drop below the Reactor Vessel flange (437'-7" elevation, 84.3% RVLIS Upper Plenum) for ≥ 15 min. (Note 3) CU2.3 <div></div> Reactor Vessel water level cannot be monitored <u>AND</u> Loss of inventory as indicated by unexplained rise in any Table C-1 sump / tank level												
	3 RCS Temp.	None		<div>Table C-3 RCS Reheat Duration Thresholds</div> <div>* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced the EAL is not applicable</div> <table><tr><th>RCS Status</th><th>Containment Closure Status</th><th>Duration</th></tr><tr><td>Intact <u>AND</u> not reduced inventory</td><td>N/A</td><td>60 min. *</td></tr><tr><td rowspan="2">Not intact <u>OR</u> reduced inventory</td><td>established</td><td>20 min. *</td></tr><tr><td>not established</td><td>0 min.</td></tr></table>		RCS Status	Containment Closure Status	Duration	Intact <u>AND</u> not reduced inventory	N/A	60 min. *	Not intact <u>OR</u> reduced inventory	established	20 min. *	not established	0 min.	Inability to maintain plant in cold shutdown CA3.1 <div></div> Any unplanned event results in RCS temperature > 200°F for > Table C-3 duration <u>OR</u> Any unplanned event results in RCS pressure rise > 10 psig due to loss of RCS cooling (this EAL does not apply in Solid Plant conditions)		Unplanned loss of decay heat removal capability with irradiated fuel in the Reactor Vessel CU3.1 <div></div> Any unplanned event results in RCS temperature > 200°F due to loss of decay heat removal capability CU3.2 <div></div> Unplanned loss of all RCS temperature and Reactor Vessel level indication for ≥ 15 min. (Note 3)	
	RCS Status	Containment Closure Status	Duration																	
	Intact <u>AND</u> not reduced inventory	N/A	60 min. *																	
Not intact <u>OR</u> reduced inventory	established	20 min. *																		
	not established	0 min.																		
4 Comm.	None		None		None		Loss of all onsite or offsite communications capabilities CU4.1 <div></div> Loss of all Table C-2 onsite (internal) communications methods affecting the ability to perform routine operations <u>OR</u> Loss of all Table C-2 offsite (external) communications methods affecting the ability to perform offsite notifications													
5 Inadvertent Criticality	None		None		None		Inadvertent criticality CU5.1 <div></div> Any unplanned sustained positive startup rate observed on nuclear instrumentation													

Notes

- Note 1:

The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results
- Note 2:

The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.
- Note 3:

The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.
- Note 4:

If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then this EAL should not be declared as it will have no adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.

Modes:

- 1

Power Operations
- 2

Startup
- 3

Hot Standby
- 4

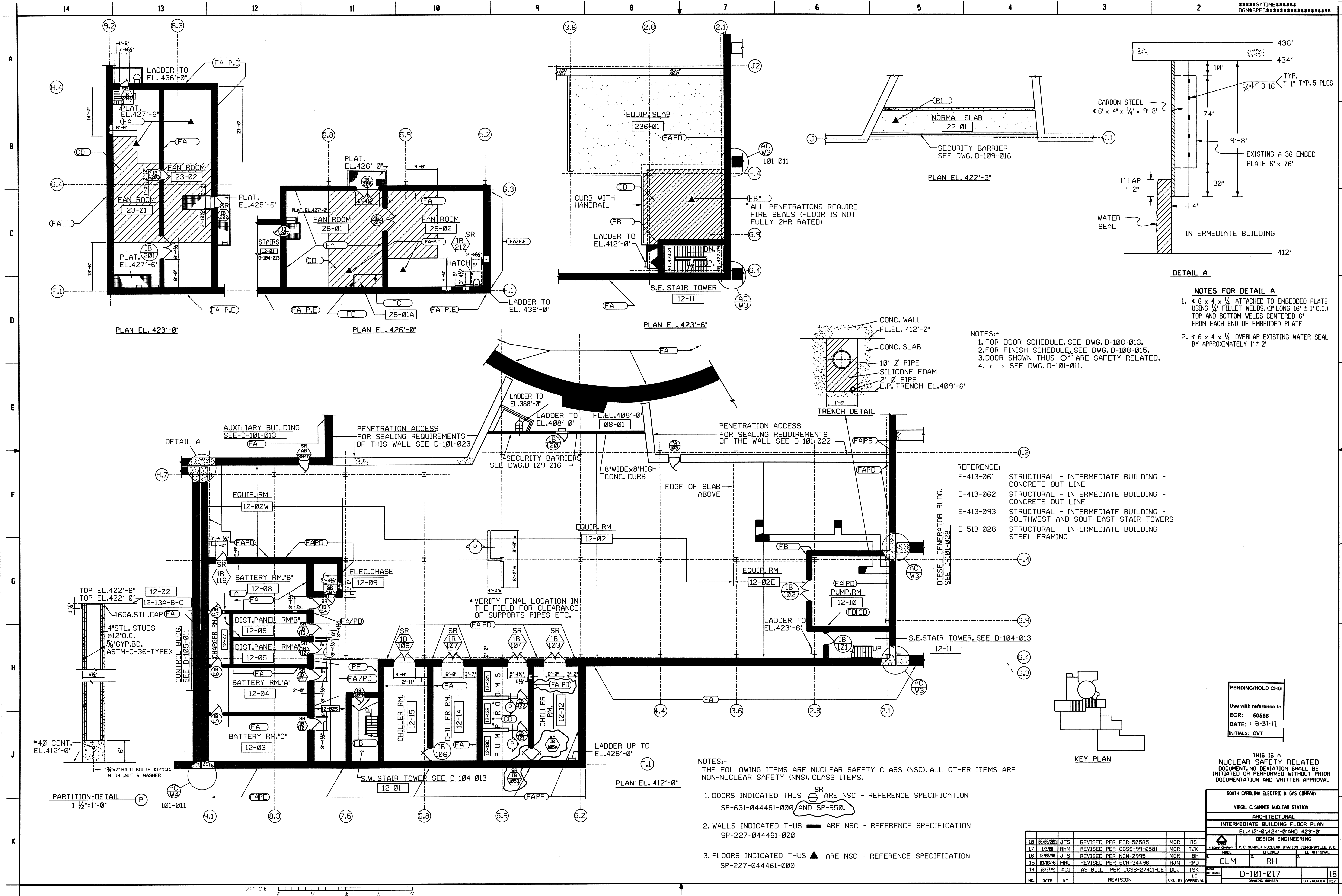
Hot Shutdown
- 5

Cold Shutdown
- 6

Refueling
- DEF

Defueled





DETAIL A

NOTES FOR DETAIL A

1. $\frac{1}{4}$ 6 x 4 x $\frac{1}{4}$ ATTACHED TO EMBEDDED PLATE USING $\frac{1}{4}$ FILLET WELDS, (3" LONG 16" \pm 1" O.C.) TOP AND BOTTOM WELDS CENTERED 6" FROM EACH END OF EMBEDDED PLATE
2. $\frac{1}{4}$ 6 x 4 x $\frac{1}{4}$ OVERLAP EXISTING WATER SEAL BY APPROXIMATELY 1" \pm 2"

NOTES:-

1. FOR DOOR SCHEDULE, SEE DWG. D-108-013.
2. FOR FINISH SCHEDULE, SEE DWG. D-108-015.
3. DOOR SHOWN THUS \odot ARE SAFETY RELATED.
4. \odot SEE DWG. D-101-011.

REFERENCE:-

- E-413-061 STRUCTURAL - INTERMEDIATE BUILDING - CONCRETE OUT LINE
- E-413-062 STRUCTURAL - INTERMEDIATE BUILDING - CONCRETE OUT LINE
- E-413-093 STRUCTURAL - INTERMEDIATE BUILDING - SOUTHWEST AND SOUTHEAST STAIR TOWERS
- E-513-028 STRUCTURAL - INTERMEDIATE BUILDING - STEEL FRAMING

KEY PLAN

PENDING/HOLD CHG
Use with reference to
ECR: 50585
DATE: 0-31-11
INITIALS: CVT

THIS IS A
NUCLEAR SAFETY RELATED
DOCUMENT. NO DEVIATION SHALL BE
INITIATED OR PERFORMED WITHOUT PRIOR
DOCUMENTATION AND WRITTEN APPROVAL

SOUTH CAROLINA ELECTRIC & GAS COMPANY			
VIRGIL C. SUMNER NUCLEAR STATION			
ARCHITECTURAL			
INTERMEDIATE BUILDING FLOOR PLAN			
EL. 412'-0", 424'-0" AND 423'-0"			
DESIGN ENGINEERING			
18 06/02/2010	JTS	REVISED PER ECR-50585	MGR RS
17 12/08/09	RMH	REVISED PER CGSS-99-0561	MGR TJK
16 12/08/09	JTS	REVISED PER NON-2995	MGR BH
15 03/03/09	MRC	REVISED PER ECR-34498	HJM RMD
14 03/07/09	ACT	AS BUILT PER CGSS-27411-DE	DDJ TSK
NO. DATE BY		REVISION	CKD. BY APPROVAL
1		CLM	LE
2		RH	LE
3			
D-101-017		DRAWING NUMBER	SHT. NUMBER REV
18			

NOTES:-

THE FOLLOWING ITEMS ARE NUCLEAR SAFETY CLASS (NSC). ALL OTHER ITEMS ARE NON-NUCLEAR SAFETY (NNS). CLASS ITEMS.

1. DOORS INDICATED THUS \odot ARE NSC - REFERENCE SPECIFICATION SP-631-044461-000 AND SP-950.
2. WALLS INDICATED THUS \blacksquare ARE NSC - REFERENCE SPECIFICATION SP-227-044461-000
3. FLOORS INDICATED THUS \blacktriangle ARE NSC - REFERENCE SPECIFICATION SP-227-044461-000

ANSWER KEY REPORT
for ILO 11-01 SRO 9/5/13 Test Form: 0

Answers

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

ANSWER KEY REPORT
for ILO 11-01 SRO 9/5/13 Test Form: 0

Answers

#	0
48	B
49	C
50	D
51	B
52	A
53	A
54	A
55	B
56	C
57	A
58	A
59	A
60	D
61	C
62	D
63	B
64	D
65	A
66	A
67	A
68	A
69	B
70	C
71	A
72	A
73	B
74	A
75	C

ANSWER KEY REPORT
for ILO 11-01 SRO 9/5/13 Test Form: 0

Answers

#	0
1	B
2	C
3	C
4	C
5	C
6	A
7	B
8	C
9	B
10	A
11	C
12	D
13	A
14	C
15	C
16	D
17	B
18	C
19	B
20	A
21	C
22	C
23	A
24	D
25	D