Mr. Gerald J. McCoy
USNRC, Region II
Enclosure 2
CR-14-01708
RC-15-0076

ENCLOSURE 2

The master examinations and answer keys

U.S. Nuclear Regulatory Commission

Site-Specific RO Written Examination

Applicant Information	
Name:	
Date: 5/20/15	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. Examination papers will be collected 6 hours after the examination begins.

Applicant Certification

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

_____
Applicant's Signature

Results	
Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

1. Initial conditions:
   - 90% power.
   - Reactor protection testing is in progress.
   - Reactor Trip Breaker "RTA" is closed.
   - Reactor Trip Breaker "RTB" is open.
   - Reactor Trip Bypass Breaker "BYB" is closed.

   Current conditions:
   - Reactor Trip Bypass Breaker "BYA" is inadvertently racked in and pushbutton RX TRIP BYPASS BKR A CLOSE was depressed.

   Which ONE of the following describes the breaker alignment following the automatic plant response?

ASSUME NO OTHER OPERATOR ACTIONS

	RTA	RTB	BYA	BYB
A.	open	open	open	closed
B.	open	open	closed	closed
C.	open	open	open	open
D.	closed	open	open	closed

2. Initial conditions:
   - 100% power initially.
   - A Pressurizer safety valve spuriously lifted and failed to reseat.
   - A Reactor Trip and Safety Injection occurred

   Current conditions:
   - All RCPs are stopped.
   - Pressurizer level is 60% and slowly rising.
   - RCS pressure is 1310 psig, stable.
   - RCS Subcooling is 0°F, stable.
   - The Pressurizer safety valve has **not** reseated.

   Which ONE of the choices below completes the following statement?

   If RCS pressure were to lower, Reactor Vessel level would __(1)__, and Pressurizer level would __(2)__.

	Reactor Vessel Level	**Pressurizer Level**
A.	remain the same	continue to rise at the same rate
B.	remain the same	rise faster
C.	lower	continue to rise at the same rate
D.	lower	rise faster

3. Given the following plant conditions:
   - 100% power initially.
   - A LOCA occurred.
   - All offsite power (115KV and 230KV) was lost.
   - **No** Charging Pumps started automatically or manually.
   - RCS pressure is 1800 psig, rising.
   - Core Exit TCs are 730 °F, rising.
   - RVLIS Narrow Range Level is 44%, lowering.

   Which ONE of the choices below completes the following statements?

   The CORE COOLING status tree of EOP-12.0, MONITORING OF CRITICAL SAFETY FUNCTIONS, will direct operators to GO TO ___(1)___ .

   When reflux boiling is the dominant mode of heat transfer in the steam generators, the principal RCS **heat removal** flow path is as follows:

   - Hot RCS exits the reactor vessel via the hot leg nozzles
   - Flows through the hot leg piping due to natural circulation
   - Condenses in the U-tubes before flowing ___(2)___

   A. 1) EOP-14.0, FR-C.1, RESPONSE TO INADEQUATE CORE COOLING
      2) through the cold leg piping, the idle RCPs and into the reactor vessel via the cold leg nozzles

   B. 1) EOP-14.0, FR-C.1, RESPONSE TO INADEQUATE CORE COOLING
      2) back down through the hot leg piping and into the reactor vessel via the hot leg nozzles

   C. 1) EOP-14.1, FR-C.2, RESPONSE TO DEGRADED CORE COOLING
      2) through the cold leg piping, the idle RCPs and into the reactor vessel via the cold leg nozzles

   D. 1) EOP-14.1, FR-C.2, RESPONSE TO DEGRADED CORE COOLING
      2) back down through the hot leg piping and into the reactor vessel via the hot leg nozzles

4. Given the following plant conditions:

   Time 1200:

   - 100% power.
   - A large break LOCA occurred.
   - All offsite power (115KV and 230KV) was lost.

   Time 1230:

   - RB Pressure peaked at 23.0 psig.

   Time **now** 1500:

   - RB Pressure is 1.0 psig and slowly lowering.

   Which ONE of the choices below completes the following statements?

   The plant Emergency Core Cooling system is currently in a ___(1)___ recirculation alignment.

   RB Spray ___(2)___ required to be in service.

   A. 1) hot leg
      2) is

   B. 1) hot leg
      2) is **not**

   C. 1) cold leg
      2) is

   D. 1) cold leg
      2) is **not**

5. Given the following plant conditions:
   - 100% power.
   - A sudden failure of the "C" RCP #2 seal has occurred.
   - The "C" RCP #1 and #3 seals are unaffected.

   Which ONE of the following identifies how the "C" RCP #2 seal failure would affect the "C" RCP #1 seal leakoff flow indication and the "C" RCP standpipe level alarm?

	#1 Seal Leakoff Flow Indication	**RCP Standpipe Level Alarm**
A.	Increases	Alarm due to **low** level
B.	Increases	Alarm due to **high** level
C.	Decreases	Alarm due to **low** level
D.	Decreases	Alarm due to **high** level

6. Given the following plant conditions:
   - The reactor is tripped.
   - A loss of charging occurred.
   - All actions of AOP-102.2, LOSS OF CHARGING, are complete.
   - All RCPs are running with the following parameters:

	RCP "A"	RCP "B"	RCP "C"
Lower seal water bearing temperature	198°F	220°F	227°F
Lower seal water outlet temperature	231°F	227°F	229°F
RCP frame composite vibration	2.2 mils	1.8 mils	1.5 mils
RCP shaft composite vibration	14 mils	20 mils	12 mils

Which ONE of the choices below completes the following statement?

Based on the current conditions, RCP trip criteria of SOP-101, REACTOR COOLANT SYSTEM, are met for _____ .

A. the "A" and "B" RCPs; trip conditions do **not** exist for the "C" RCP

B. the "B" and "C" RCPs; trip conditions do **not** exist for the "A" RCP

C. the "A" and "C" RCPs; trip conditions do **not** exist for the "B" RCP

D. all three RCPs

7. Given the following plant conditions:

   - Unit 1 core off-load is in progress.
   - Water level is 23.5' above the Reactor Pressure Vessel (RPV) flange.
   - Operators are preparing to move fuel located in the vicinity of the RPV hot legs.

   Which ONE of the choices below completes the following statements?

   Based on the current conditions, Technical Specification 3.9.7, RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION HIGH WATER LEVEL, ___(1)___ allow operators to remove all RHR loop(s) from operation for up to 1 hour per 8-hour period.

   The ACTION statement of TS 3.9.7 specifies that, among other actions, operators are required to **immediately** initiate ___(2)___ when no RHR loop(s) are OPERABLE and in operation.

   A. 1) does
      2) corrective action to return the required RHR loop to OPERABLE and operating status as soon as possible

   B. 1) does **not**
      2) corrective action to return the required RHR loop to OPERABLE and operating status as soon as possible

   C. 1) does
      2) action to close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere

   D. 1) does **not**
      2) action to close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere

8. Given the following plant conditions:
   - 100% power.
   - XCP-607, 2-5, INSTR AIR PRESS LO FLO HI is in alarm.
   - XCP-607, 2-6, SERV AIR PRESS LO is in alarm.
   - PI-8342, INST AIR HDR PRESS PSIG reads 55 psig.

   Which ONE of the choices below completes the following statements?

   IPV08324-SA, STATION AIR SUPPLY HDR PRESS CONT VALVE is ___(1)___.

   Turbine Group "A" and Group "B" drain valves will trip ___(2)___ on low air pressure.

   A. 1) open.
      2) open

   B. 1) open.
      2) closed

   C. 1) closed.
      2) open

   D. 1) closed.
      2) closed

9. Given the following plant conditions:

   - 100% power, stable.
   - Pressurizer Pressure Control was in AUTO.
   - Pressurizer pressure was 2235 psig, stable.
   - PT-444, PZR Pressure Transmitter **instantly** failed to an output corresponding to 2280 psig.

   Which ONE of the choices below completes the following statement?

   Immediately after the PT-444 failure, the Master Pressure Controller will demand the spray valves to be ____(1)____ .

   As time continues, the spray valves will _____(2)_____.

ASSUME NO OPERATOR ACTIONS

A. 1) fully closed
   2) remain **fully closed**.

B. 1) 40% open
   2) **open** more than 40% open as integral action takes effect.

C. 1) 40% open
   2) **close** to less than 40% open as integral action takes effect.

D. 1) 60% open
   2) **open** more than 60% open as integral action takes effect.

10. Initial conditions:

- 90% power.
- A spurious automatic Phase "B" isolation actuation occurred.
- The operators attempted to trip the reactor manually.
  - The reactor **failed** to trip.

Current conditions:

- EOP-13.0, RESPONSE TO ABNORMAL NUCLEAR POWER GENERATION, in progress.
- T_{AVG} is 14 °F higher than T_{REF}.
- Reactor Power is 10% and lowering.
- All RCPs are running.
- The NROATC has just completed fully inserting all **Control** Bank rods.
- All **Shutdown** Bank rods are fully withdrawn.

Which ONE of the choices below completes the following statements in accordance with EOP-13.0?

Based on the current conditions, operators ___(1)___ required to immediately trip all RCPs.

To provide the fastest negative reactivity insertion rate, operators will _____(2)_____ .

A. 1) are
   2) allow Shutdown banks to insert automatically.

B. 1) are
   2) manually insert Shutdown banks.

C. 1) are **not**
   2) allow Shutdown banks to insert automatically.

D. 1) are **not**
   2) manually insert Shutdown banks.

11. Given the following plant conditions:

Time 0420:

- A tube rupture occurred in the "C" Steam Generator (SG).
- The Reactor was manually tripped.
- All offsite power (115KV and 230KV) was lost at the time of trip.
- All systems responded as designed.

Time 0425:

- EOP-1.0, REACTOR TRIP OR SAFETY INJECTION ACTUATION in progress.
- "C" SG NR level is 22% and slowly rising.

Time 0435:

- EOP-4.0, STEAM GENERATOR TUBE RUPTURE is in progress.
- Operators isolated EFW flow to the "C" SG by closing the appropriate FCV's.
- "C" SG NR level is 28% and stable.

Time 0440:

- RCS cooldown in accordance with EOP-4.0 in progress.
- "C" SG NR level is 24% and slowly lowering.
- "A" and "B" SG NR levels are 55% and stable.

Which ONE of the choices below completes the following statements?

Based on the given sequence of events, EOP-4.0 ___(1)___ require operators to secure the Turbine-driven EFW pump.

At **time 0440**, operators are required to ___(2)___ , in accordance with EOP-4.0.

A. 1) does
   2) maintain EFW isolated to the "C" SG.

B. 1) does
   2) restore feeding the "C" SG with EFW.

C. 1) does **not**
   2) maintain EFW isolated to the "C" SG.

D. 1) does **not**
   2) restore feeding the "C" SG with EFW.

12. Given the following plant conditions:

    - A large steam break occurred downstream of the Main Steam Isolation Valves (MSIVs).
    - An automatic reactor trip and safety injection occurred.
    - **All** MSIVs failed OPEN and could **not** be manually closed.
    - EOP-3.1, ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS (SG), is in progress.

    Which ONE of the choices below completes the following sentence?

    The reason for the CAUTION in EOP-3.1 that requires a minimum EFW flow be maintained to each SG that has a Narrow Range level LESS THAN 26% is _____ .

    A. to minimize thermal shock to SG components

    B. to maintain the ability to diagnose a subsequent SG tube rupture

    C. to maintain a cooldown rate in the RCS Cold Legs LESS THAN 100°F/hr

    D. to prevent damage to EFW pumps due to operating for long periods of time at low flow conditions

13. Given the following plant conditions:

- The plant was operating at 100%.
- All offsite power (115KV and 230KV) was lost.
- "A" and "B" Emergency Diesels failed to start.
- EOP-6.0, LOSS OF ALL ESF AC POWER is in progress.
- Operators have just begun depressurizing all intact Steam Generators (SGs) to 240 psig.

Which ONE of the choices below completes the following statements, in accordance with EOP-6.0?

Operators are required to maintain the cooldown rate in RCS Cold Legs below a **maximum** of _____(1)_____ .

If Pressurizer level is lost and Reactor Vessel Head voiding begins to occur during the cooldown, operators ___(2)___ required to stop the SG depressurization.

A. 1) 50 °F/hr
   2) are

B. 1) 50 °F/hr
   2) are **not**

C. 1) 100 °F/hr
   2) are

D. 1) 100 °F/hr
   2) are **not**

14. Given the following plant conditions:

- 100% power initially.
- All offsite power (115KV and 230KV) was lost.
- "A" and "B" Emergency Diesels failed to start.
- EOP-6.0, LOSS OF ALL ESF AC POWER is in progress.
- Operators are at step 8 of EOP-6.0 which reads as follows:

  "Place the switches for the following equipment in PULL TO LK NON-A to prevent auto start:"

Which ONE of the choices below completes the following statement?

A ____(1)_____ will be kept available during the performance of step 8 of EOP-6.0 to provide cooling for _____(2)_____ upon restoration of power.

A. 1) CCW pump
   2) RCP thermal barriers

B. 1) CCW pump
   2) Spent Fuel heat exchangers

C. 1) Service Water pump
   2) Diesel Generators

D. 1) Service Water pump
   2) CCW heat exchangers

15. Given the following plant conditions:

- Mode 3.
- Battery charger XBC1A-1B was in service on battery XBA1A.
- The Static Switch for APN5901 was in NORMAL.
- Battery Charger XBC1A is ready for service.
- An uninsulated tool was inadvertently dropped on the XBA1A battery terminals.
- The following events occurred:
  - The XBA1A battery lead terminals to 1HA vaporized and **separated from the battery**.
  - Battery charger XBC1A-1B **deenergized**.
  - Motor Control Center 1DA2Y **deenergized**.
- Bus 1HA has remained **intact**.

Which ONE of the choices below completes the following statement regarding power to APN5901?

APN5901 is currently:

ASSUME NO OPERATOR ACTIONS

A. deenergized; power can be restored by manually aligning the static switch for APN5901 to BYP TO PREF.

B. deenergized; power can be restored by manually aligning XBC1A to 1HA.

C. energized via the static switch and APN1FA.

D. energized via bus 1DA1 and inverter XIT5901.

16. Given the following plant conditions:

- 100% power initially.
- A grid disturbance was reported by the System Controller.
- AOP-301.1, RESPONSE TO ELECTRICAL GRID ISSUES, in progress.
- Grid frequency is lowering linearly and slowly.

Which ONE of the choices below completes the following statements?

RCP supply breakers will automatically trip open if their associated motor frequency goes below a setpoint of ___(1)___ .

___(2)___ will open automatically as a **direct** result of grid frequency lowering to a specified setpoint.

A. 1) 57.5 HZ
   2) XCB0010, MAIN GENERATOR CIRCUIT BREAKER

B. 1) 57.5 HZ
   2) OCB 8902, MAIN XFMR FEED

C. 1) 58.5 HZ
   2) XCB0010, MAIN GENERATOR CIRCUIT BREAKER

D. 1) 58.5 HZ
   2) OCB 8902, MAIN XFMR FEED

17. Given the following plant conditions:

- A small break LOCA has occurred.
- RB Pressure peaked at 2.8 psig and is slowly lowering.
- **No** EFW pumps are available.
- EOP-15.0, RESPONSE TO LOSS OF SECONDARY HEAT SINK is in progress.

Plant parameters are as follows:

Time	PZR pressure	SG "A" WR level	SG "B" WR level	SG "C" WR level
0400	2250 and rising	11%	22%	24%
0410	2300 and rising	8	11	22
0420	2340 and rising	7	10	20
0430	2345 and rising	6	8	10

Of the choices below, which ONE of the following is the **first** time conditions are met to initiate bleed and feed cooling, in accordance with EOP-15.0 ?

A. 0400

B. 0410

C. 0420

D. 0430

18. Initial Conditions:

- A small break LOCA has occurred.
- A rupture of the RWST occurred.
- Operators entered EOP-2.4, LOSS OF EMERGENCY COOLANT RECIRCULATION.
- Charging and RHR pumps were placed in PULL TO LK NON-A as directed by EOP-2.4.

Current Conditions:

- RCS pressure is 450 psig and stable.
- The RWST rupture has been temporarily repaired.
- Operators have established makeup to the RWST.
- The Technical Support Center (TSC) has determined that RWST level can be maintained without further loss of volume from the rupture.
- RWST level is 20%, increasing.
- RHR sump level is 412 ft, stable.
- MVG-8706A(B), RHR LP A(B) TO CHG PP are **closed**.

Which ONE of the choices below completes the following statement in accordance with EOP-2.4?

Based on the current conditions, operators will:

A. leave Charging Pumps in PULL TO LK NON-A and start **only** one RHR Pump to provide maximum cooling flow to the core.

B. leave RHR pumps in PULL TO LK NON-A and start **only** one Charging Pump to establish core cooling and conserve RWST inventory.

C. maintain Charging and RHR Pumps in PULL TO LK NON-A to avoid running with inadequate net positive suction head.

D. start one Charging Pump **and** one RHR pump in the same train to prepare for restoration of recirculation capability.

19. Given the following plant conditions:

- A reactor trip occurred from 100% power.
- Shutdown Bank "A" rod "J3" is stuck at its fully withdrawn position.
- Control Bank "C" rod "D12" is stuck at 70 steps withdrawn.
- All other Shutdown and Control rods are completely inserted.

Which ONE of the following identifies how the manual Shutdown Margin (SDM) calculation of STP-134.001, SHUTDOWN MARGIN VERIFICATION accounts for the stuck rods in the conditions above?

A. The two stuck rods do **not** affect the post-trip SDM calculation because refueling boron concentration is used as the reference condition.

B. The position of rod "J3" does **not** affect the SDM calculation. A positive reactivity value is assessed for rod "D12" and the boron concentration is adjusted to compensate for one stuck rod.

C. The position of rod "D12" does **not** affect the SDM calculation. A positive reactivity value is assessed for rod "J3" and the boron concentration is adjusted to compensate for one stuck rod.

D. A positive reactivity value is assessed for both rods "J3" and "D12" in the SDM calculation. The boron concentration is adjusted to compensate for two stuck rods.

20. Initial conditions:

- MODE 1.
- Pressurizer heaters BU GRP 1 control switch is in AFTER CLOSE.
- Pressurizer heaters BU GRP 2 control switch is in AFTER TRIP.

Current conditions:

- A malfunction of FCV-122 has caused Pressurizer level to lower.
- **Actual** Pressurizer level is 45% decreasing.
- Pressurizer program level is 51%.
- Pressurizer pressure is 2219 psig, lowering.

Which ONE of the choices below completes the following statements?

XCP-616, 1-5, PZR LCS DEV HI/LO ___(1)___ in alarm.

All Pressurizer **backup** heaters ___(2)___ energized.

ASSUME NO OPERATOR ACTIONS

A. 1) is
   2) are

B. 1) is
   2) are **not**

C. 1) is **not**
   2) are

D. 1) is **not**
   2) are **not**

21. Given the following plant conditions:

- MODE 6 with core off-load in progress.
- The Fuel Handling Building (FHB) SRO reports that a fuel bundle was binding while inserting into the rack, and is now stuck approximately 50% inserted.
- The fuel bundle cannot be fully inserted or removed.
- All radiation monitors in both the RB and the FHB are reading the same normal levels as before the report of the stuck fuel bundle.

Which ONE of the following choices below completes the following statement?

Based on the given conditions, entry conditions for AOP-123.3, POTENTIAL FUEL ASSEMBLY DAMAGE WHILE HANDLING FUEL,

_____ .

A. are **not** met, because AOP-123.3 only mitigates potential fuel handling accidents in the RB, not the FHB.

B. are **not** met, because there are no radiation monitors in the RB or FHB that are indicating increasing radiation levels.

C. are met, and AOP-123.3 will require evacuation of unnecessary personnel from the FHB because the stuck fuel assembly could be potentially damaged.

D. are met, but AOP-123.3 will **not** require evacuation of unnecessary personnel from the FHB because FHB radiation levels are **not** increasing.

22. Which ONE of the choices below completes the following statement?

A CAUTION in AOP-206.1, DECREASING MAIN CONDENSER VACUUM, states that if Main Condenser pressure is GREATER THAN ____(1)____ , Main Turbine load must NOT be reduced to LESS THAN ___(2)___ , to prevent Turbine damage.

A. 1) 5 inches Hg absolute
   2) 30%

B. 1) 5 inches Hg absolute
   2) 50%

C. 1) 7.5 inches Hg absolute
   2) 30%

D. 1) 7.5 inches Hg absolute
   2) 50%

23. Given the following plant conditions:

- Operators manually tripped the Reactor from the Main Control Board before evacuating the Control Room.
- Two (2) control rods did **not** fully insert on the Reactor trip.
- AOP-600.1, CONTROL ROOM EVACUATION is in progress.
- Operators are referring to AOP-106.1 EMERGENCY BORATION and aligning for boration in Step 4, "Emergency Borate by gravity drain of the Boric Acid Tank."

Which ONE of the choices below completes the following statements?

Based on the given conditions, AOP-600.1 requires operators to borate _____(1)_____

The Operators are cautioned in AOP-106.1 to monitor Charging pump amps and flow carefully while performing the gravity drain alignment because _____(2)_____ must be closed.

A. 1) a fixed amount of 2500 gallons.
   2) LCV-115C(E), VCT OUTLET ISOL valves

B. 1) a fixed amount of 2500 gallons.
   2) XVD08329-CS, CHARGING/SI PUMPS SUCTION HEADER VALVE and XVD08331-CS, CHARGING/SI PUMPS SUCT HDR ISOL VALVE

C. 1) an amount determined by a Shutdown Margin calculation based on temperature.
   2) LCV-115C(E), VCT OUTLET ISOL valves

D. 1) an amount determined by a Shutdown Margin calculation based on temperature.
   2) XVD08329-CS, CHARGING/SI PUMPS SUCTION HEADER VALVE and XVD08331-CS, CHARGING/SI PUMPS SUCT HDR ISOL VALVE

24. Initial Conditions:

- A Small-break LOCA with multiple coincident equipment failures occurred.
- Operators entered EOP-14.0, FR-C.1, RESPONSE TO INADEQUATE CORE COOLING.
- No RCPs are running.

Current Conditions:

- Operators are performing continuous action step 13, "Check INTACT SG Levels," of EOP-14.0.
- XCP-621, 3-5 EFP SUCT HDR PRESS LO XFER TO SW has just alarmed.
- LI-3621A, CST LEVEL FEET, is reading 6.0 feet, slowly lowering.
- PI-3632, EF PP SUCT PRESS, is reading 12.1 psig, slowly lowering.

(1)

Which ONE of the choices below completes the following statements?

Based on the current conditions, the automatic signal to transfer EFW suction to Service Water ___(1)___ actuated.

A NOTE in EOP-14.0 states that the preferred RCP starting sequence under Inadequate Core Cooling conditions is ___(2)___ .

A. 1) has
   2) B, C, A

B. 1) has
   2) C, B, A

C. 1) has **not**
   2) B, C, A

D. 1) has **not**
   2) C, B, A

(1) ADD ADDITIONAL BULLET UNDER CURRENT CONDITIONS: "• ALL EFW PUMP SUCTION PRESSURES ARE 12.1 psig, SLOWLY LOWERING."

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25. Given the following plant conditions:

Time 0700:

- 100% power.
- An HP technician notifies the control room that radiation surveys in the vicinity of the letdown piping were unexpectedly high and increasing.
- Normal letdown is in service at a flow rate of 105 gpm and stable.

Time 0705:

- XCP-642, 4-3, RC LTDN LO RNG RM-L1 HI RAD (XCP-642 4-3) is in alarm.

Which ONE of the choices below completes the following statement?

As a result of the RM-L1 high radiation alarm, _____

A. letdown flow will automatically isolate.

B. letdown flow will automatically divert away from the VCT.

C. operators will take manual actions to **maximize** letdown flow by placing only the two 60 gpm letdown orifices in service.

D. operators will take manual actions to **minimize** letdown flow by placing only the 45 gpm letdown orifice in service.

26. Given the following plant conditions:

- 100% power initially.
- A LOCA has occurred.
- Operators are performing EOP-2.1, "ES-1.2, POST-LOCA COOLDOWN AND DEPRESSURIZATION."
- A RCS cooldown at a rate less than 100 °F/hr on RCS Cold Legs is in progress.
- RCP "A" is the **only** running RCP.
- Plant parameters are as follows:
  - SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.
  - Subcooling is 49.5 °F and lowering.
  - RCS Pressure is 1410 psig and lowering.
  - T_{cold} is 540 °F and lowering.

Which ONE of the choices below completes the following statements?

Based on the current conditions, operators __(1)__ required to secure the "A" RCP.

If no additional accident or failure occurs, EOP-2.1 ___(2)__ contain the procedural guidance that will lower RCS temperature and pressure to the values necessary to place RHR cooling in service.

A. 1) are **not**
   2) does

B. 1) are **not**
   2) does **not**

C. 1) are
   2) does

D. 1) are
   2) does **not**

(1) MODIFY 4TH BULLET TO READ: "AN OPERATOR-CONTROLLED RCS COOLDOWN ...."

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27. Given the following plant condition:

- Operators have entered EOP-16.0, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, following an automatic Reactor trip and Safety Injection.

Which ONE of the choices below completes the following statements?

EOP-16.0 directs the operators to check if SI can be terminated using the following parameters: RCS subcooling(,) ___(1)___ .

After the temperature soak period has been completed in accordance with EOP-16.0, operators are required to limit the subsequent cooldown rate in the RCS Cold Legs to a **maximum** of ___(2)___ in **any one** hour period.

A. 1) and RVLIS level
   2) 25°F

B. 1) and RVLIS level
   2) 50°F

C. 1) total EFW flow or SG narrow range level, RCS pressure, and PZR level.
   2) 25°F

D. 1) total EFW flow or SG narrow range level, RCS pressure, and PZR level.
   2) 50°F

28. Given the following plant conditions:

Time 0100:

- Operators have entered EOP-6.0, LOSS OF ALL ESF AC POWER, following a large seismic event.
- Alternate Seal Injection (ASI) is inoperable and out of service.

Time 0115.

- The control room operators are at the step in EOP-6.0 to depressurize all intact Steam Generators (SGs) to 240 psig.
- The ASI system is **available** to be manually started.

Which ONE of the choices below completes the following statement?

In accordance with a CAUTION in EOP-6.0, operators ___(1)___ manually start the ASI system, because _____(2)_____.

A. 1) should
   2) re-establishing seal injection in a controlled manner would result in limiting the potential that a RCP seal LOCA could occur.

B. 1) should
   2) re-establishing seal injection would add both inventory and boron to the RCS that would help establish stable conditions (such as shutdown margin) during the imminent cool down.

C. 1) should **not**
   2) if the ASI system is in operation, then Pressurizer level will likely be increasing, and EOP-6.0 has directed operators to isolate letdown.

D. 1) should **not**
   2) thermal shock to the RCP seals could result in a RCP seal LOCA with significant increase in RCS water loss.

29. Given the following:

- Operators are placing Auxiliary Spray in service in accordance with SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM, Section III.O, PRESSURIZER AUXILIARY SPRAY OPERATION.

Which ONE of the choices below completes the following statements?

A NOTE in SOP-102, Section III.O. states that TI-140, REGEN HX OUT TEMP °F, should be maintained less than ___(1)___ .

LCO 3.4.9.2, PRESSURIZER, statement c., requires that the pressurizer temperature shall be limited to a maximum auxiliary spray water differential of ___(2)___ .

A. 1) 350 °F
   2) 320 °F

B. 1) 350 °F
   2) 625 °F

C. 1) 400 °F
   2) 320 °F

D. 1) 400 °F
   2) 625 °F

30. Initial conditions:

- 75% power.
- VCT level is 30%, stable.
- TCV-143, LTDN TO VCT OR DEMIN control switch is in the AUTO position.

Current condition:

- A 10 gpm tube leak has developed in the Letdown Heat Exchanger.

Which ONE of the choices below completes the following statements?

The leak in the Letdown Heat Exchanger will cause VCT level to **initially** trend ____(1)____ .

TCV-143, will automatically shift to the VCT position when the Letdown Heat Exchanger outlet coolant temperature reaches the high temperature setpoint of __(2)__ .

ASSUME NO OPERATOR ACTIONS

A. 1) lower.
   2) 135 °F.

B. 1) lower.
   2) 155 °F.

C. 1) higher.
   2) 135 °F.

D. 1) higher.
   2) 155 °F.

31. Given the following plant conditions:

- Plant cooldown is in progress in accordance with GOP-6, PLANT SHUTDOWN FROM HOT STANDBY TO COLD SHUTDOWN MODE 3 TO MODE 5.
- RCS temperature is 330°F and lowering.

Which ONE of the choices below completes the following statements?

The **highest** RCS temperature at which Cold Overpressure Protection is required to be placed in service is ___(1)___ in accordance with 3.4.9.3, REACTOR COOLANT SYSTEM - OVERPRESSURE PROTECTION SYSTEMS.

When XVR08708A-RH, RH INLET HEADER A RELIEF VALVE is placed in service, it will lift at a setpoint of ___(2)___ .

A. 2) 200°F.
   1) 450 psig

B. 1) 200°F.
   2) 600 psig

C. 2) 300°F.
   1) 450 psig

D. 1) 300°F.
   2) 600 psig

32. Given the following plant conditions:

Time 1600:

- A large-break LOCA has occurred.
- EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT in progress.
- EOP-17.0, RESPONSE TO HIGH REACTOR BUILDING PRESSURE was entered due to an ORANGE path on the CONTAINMENT Critical Safety Function (CSF).
- All other safety functions are GREEN.

Time 1610:

- The actions of EOP-17.0 have **not** been completed.
- An ORANGE path for INTEGRITY is now indicated.
- All other CSF statuses are GREEN.

Time 1615:

- The EOP in progress is still **not** complete.
- The INTEGRITY CSF status just turned GREEN.
- All other CSF statuses **have remained GREEN since 1610**.

Which ONE of the following describes the correct procedural implementation in accordance with OAP-103.4, EOP/AOP USER'S GUIDE?

Note: EOP-16.0 is RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK.

A. At 1610, operators will suspend performance of EOP-17.0 and enter EOP-16.0.

   At 1615, operators will continue in EOP-16.0 until all actions are complete.

B. At 1610, operators will suspend performance of EOP-17.0 and enter EOP-16.0.

   At 1615, operators will stop actions of any EOP entered for a CSF status and return to EOP-2.0.

C. At 1610, operators will continue in EOP-17.0.

   At 1615, Operators will continue until actions in EOP-17.0 are complete and then transfer to EOP-16.0.

D. At 1610, operators will continue in EOP-17.0.

   At 1615, operators will continue until the actions of EOP-17.0 are complete and then return to EOP-2.0.

33. Given the following plant conditions:

Time 0900:

- 100% power initially.
- A LOCA occurred with multiple equipment failures.
- EOP-14.0, FR-C.1, RESPONSE TO INADEQUATE CORE COOLING in progress.
- The operators were unable to establish safety injection flow to the RCS.

Time 0920:

- When operators attempted to close SI Accumulator discharge isolation valves, both MVG-8808A, A DISCH ISOL; and MVG-8808C, C DISCH ISOL, failed to close.

Which ONE of the choices below completes the following statements in accordance with EOP-14.0?

After attempting to re-establish safety injection flow at **0900**, the **next** major action category of EOP-14.0 directed operators to _____(1)_____ .

At **0920**, operators are required to vent Nitrogen (N2) from _____(2)_____ .

A. 1) start RCPs and open all RCS vent paths to containment.
   2) **all** SI Accumulators.

B. 1) start RCPs and open all RCS vent paths to containment.
   2) the two affected SI Accumulators.

C. 1) rapidly depressurize Steam Generators (SGs) to depressurize the RCS
   2) **all** SI Accumulators.

D. 1) rapidly depressurize Steam Generators (SGs) to depressurize the RCS
   2) the two affected SI Accumulators.

34. Given the following plant conditions:

- 100% power.
- PRT level has been unexpectedly rising over the last few weeks.

Which ONE of the following is **not** a potential source of leakage into the PRT?

A. XVR08117-CS, LETDOWN FLOW CONTROL HDR RELIEF VALVE (RB 412')

B. XVR-8121, RC PUMP SEAL RETURN HEADER RELIEF VALVE (RB 412')

C. MVG-8095A, RX HEAD VENT VLV (RB 463')

D. XVN-8032, RV FLNGE LKOFF (RB 412')

35. Which ONE of the following describes the **maximum** time limit, if any, for operation of RHR pumps without CCW flow to the RHR Heat Exchangers In accordance with AOP-118.1, TOTAL LOSS OF COMPONENT COOLING WATER?

A. 10 minutes

B. 20 minutes

C. 90 minutes

D. no time limit, as long as any maximum temperature is **not** exceeded

36. Initial conditions:

- MODE 3 at normal operating pressure.
- Pressurizer Pressure Control is in AUTO.

Current conditions:

- The following Pressurizer Pressure Channel indications are noted:
  - PI-444 = 2050 psig
  - PI-445 = 2500 psig
  - PI-455 = 2000 psig
  - PI-456 = 1950 psig
  - PI-457 = 2050 psig

Based on the current conditions, which ONE of the following describes the positions of Pressurizer PORVs (PCV-444B, PCV-445A, and PCV-445B)?

ASSUME NO OPERATOR ACTION

	PCV-444B	PCV-445A	PCV-445B
A.	OPEN	OPEN	OPEN
B.	CLOSED	OPEN	OPEN
C.	OPEN	OPEN	CLOSED
D.	CLOSED	CLOSED	CLOSED

37. Initial Conditions:

- 100% power.
- Train B SSPS testing in accordance with STP-345.074, SSPS ACTIVATION LOGIC AND MASTER RELAY TEST FOR TRAIN B is in progress.
- Reactor Trip breaker A (RTA) is CLOSED
- Bypass breaker A (BYA) is OPEN.
- Reactor Trip breaker B (RTB) is CLOSED.
- Bypass breaker B (BYB) is CLOSED.

Current conditions:

- The input supply breaker on DPN1HA to DPN1HA1 tripped open.
  - Control power to the associated train of Reactor trip and bypass breakers has been **lost**.
- Power to Safeguards Cabinet Channel A is **not** affected.

Which ONE of the following describes the current Reactor Trip and Bypass breaker positions and the **next** required operator action(s) to address this event?

A. Trip and Bypass breaker positions have not changed; Manually trip the reactor and perform the immediate operator actions of EOP-1.0, Reactor Trip or Safety Injection.

B. **Only** RTA has opened; dispatch an operator to investigate and reset the tripped breaker at DPN1HA per the applicable ARP.

C. **Only** RTA and BYB have opened; perform the immediate operator actions of EOP-1.0, Reactor Trip or Safety Injection.

D. Trip and Bypass breaker positions have not changed; dispatch an operator to investigate and reset the tripped breaker at DPN1HA per the applicable ARP.

38. Given the following plant conditions:

Time 0500:

- 100% power.
- A malfunction caused a loss of output voltage from Inverter XIT-5903.

Time 0510:

- Personnel installing scaffolding inadvertently trip **open** the 1DB bus normal feed breaker.
- **No** operator actions have occurred.
- Any designed automatic actions have occurred.

Which ONE of the choices below completes the following statement?

Based on the current conditions, the "B" Emergency Diesel Generator will automatically start, _____.

A. but its output breaker will **not** close.

B. its output breaker will close, but **no** loads will automatically start.

C. its output breaker will close, and **all** loads that were energized prior to the 1DB undervoltage will re-energize simultaneously.

D. its output breaker will close, and **all** required loads will automatically start sequentially via the blackout sequencer.

39. Given the following plant conditions:

Time 0320:

- 100% power initially.
- "1A", "1B", and "2A" RBCUs were running in NORM (fast speed).
- The RBCU TRAIN A EMERG switch is selected to XFN 64A.
- The RBCU TRAIN B EMERG switch is selected to XFN 64B.
- An automatic Safety Injection (SI) occurs.

Time 0322:

- RBCU "1B" tripped on overload.

Time at 0330:

- No operator actions have occurred relating to the RBCU systems.
- The operator performing Attachment 3, SI EQUIPMENT VERIFICATION, of EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION, is at the step to ensure proper RBCU system alignment.

Which ONE of the choices below completes the following statements?

At time 0330, before taking any manual actions, the operator performing SI equipment verification will find the "2A" RBCU ___(1)___.

If "2B" RBCU is started at 0331 in slow speed with the RBCU TRAIN B EMERG switch aligned to the XFN 65B position, this ___(2)___ satisfy the Attachment 3 requirement for running RBCUs.

A. 1) running
   2) will **not**

B. 1) running
   2) will

C. 1) **not** running
   2) will **not**

D. 1) **not** running
   2) will

40. Given the following plant conditions:

- MODE 1.
- "1A" RBCU is being returned to service following bearing replacement.
- Mechanical Maintenance requested that the fan be started in NORM.
- After running for two (2) minutes, Maintenance requested that the fan be stopped.

Current conditions:

- 35 minutes after the fan was stopped, Maintenance requests that the fan be restarted.

Which ONE of the choices below completes the following statements?

In accordance with SOP-114, REACTOR BUILDING VENTILATION SYSTEM, when starting the fan in NORM, the control switch must be held in START until the RED breaker closed light is lit **and** _____(1)_____ .

Based on the current conditions, operators ___(2)___ allowed to **immediately** restart the "1A" RBCU in accordance with SOP-114.

A. 1) starting current is indicated on the fan's amp meter
   2) are

B. 1) starting current is indicated on the fan's amp meter
   2) are **not**

C. 1) annunciator XCP-606 (1-1), RBCU 1A/2A FAN TRIP, clears
   2) are

D. 1) annunciator XCP-606 (1-1), RBCU 1A/2A FAN TRIP, clears
   2) are **not**

41. Which ONE of the choices below completes the following statements?

Sodium Hydroxide (NaOH) is added to Reactor Building (RB) Spray flow in order to reduce the concentration of ___(1)___ in the RB atmosphere after a LOCA.

MVG-3002A and MVG-3002B, NaOH suction line isolation valves, are **directly** interlocked to automatically open in response to a _____ (2)_____ .

A. 1) explosive hydrogen
   2) RB spray actuation signal

B. 1) explosive hydrogen
   2) phase 'A' containment isolation signal

C. 1) radioactive iodine
   2) RB spray actuation signal

D. 1) radioactive iodine
   2) phase 'A' containment isolation signal

42. Given the following plant conditions:

- 100% power initially.
- Cold weather has caused RWST level indicators LI-991, LI-992, and LI-993 to freeze and they are unable to respond to level changes.
- RWST level indicator LI-990 remained OPERABLE.
- A large-break LOCA occurred causing an automatic Reactor trip, automatic Safety Injection, and automatic RB Spray actuation.

Which ONE of the choices below completes the following statements?

When **actual** RWST level lowers below 18%, _____(1)_____ .

Valve XVG-3001A, RWST TO SPRAY PUMP A SUCT, will **not** automatically close because _____(2)_____ .

ASSUME NO OPERATOR ACTIONS

A. 1) valve XVG-3005A, SUMP ISOL LOOP A, will have received an automatic open signal; valve XVG-3004A, SUMP ISOL LOOP A, will **not** have received an automatic open signal.

2) it is **directly** interlocked to close on a RWST level signal, and the required coincidence is not met due to the frozen RWST level instruments

B. 1) valve XVG-3005A, SUMP ISOL LOOP A, will have received an automatic open signal; valve XVG-3004A, SUMP ISOL LOOP A, will **not** have received an automatic open signal

2) it is **directly** interlocked to close when **both** XVG-3004A and XVG-3005A are fully open, and the required coincidence is not met due to the valve positions

C. 1) both valves XVG-3005A, SUMP ISOL LOOP A, and XVG-3004A, SUMP ISOL LOOP A, will **not** have received an automatic open signal.

2) it is **directly** interlocked to close on a RWST level signal, and the required coincidence is not met due to the frozen RWST level instruments

D. 1) both valves XVG-3005A, SUMP ISOL LOOP A, and XVG-3004A, SUMP ISOL LOOP A, will **not** have received an automatic open signal

2) it is **directly** interlocked to close when **both** XVG-3004A and XVG-3005A are fully open, and the required coincidence is not met due to the valve positions

43. Initial conditions:

- 45% power.
- The STM DUMP MODE SELECT Switch is in TAVG.

Current condition:

- Operators manually tripped the Main Turbine to address an oscillating Turbine control valve.
- C7-B status light is **bright**.

Which ONE of the following is the T_{AVG} deviation band ($T_{AVG} - T_{REF}$) within which the Atmospheric Steam Dump Valves (IFV-2006, IFV-2016, IFV-2026) will actuate?

	FULL CLOSE	FULL OPEN
A.	$\leq$ 2 °F	$\geq$ 5.7 °F
B.	$\leq$ 5.7 °F	$\geq$ 16.9 °F
C.	$\leq$ 16.9 °F	$\geq$ 22.4 °F
D.	$\leq$ 22.4 °F	$\geq$ 28 °F

44. Given the following initial conditions:

- 50% power.
- "B" and "C" Feedwater Pumps running.
- "A" Feedwater Pump being returned to service in accordance with SOP-210, FEEDWATER SYSTEM, following emergent maintenance.
- The pump was running at a stable speed of 4200 RPM with the DCS M/A station in Auto.

Current conditions:

- The "A" Feedwater Pump speed begins to increase uncontrollably at a rate of approximately 100 RPM per minute.

Which ONE of the choices below completes the following statement?

As "A" Feedwater Pump speed continues to increase, either the overspeed setpoint of ____(1)____ or the high discharge pressure setpoint of __(2)__ could cause the pump to trip.

A. 1) 5670 rpm
   2) 1660 psig

B. 1) 5670 rpm
   2) 1720 psig

C. 1) 6380 rpm
   2) 1660 psig

D. 1) 6380 rpm
   2) 1720 psig

45. Given the following plant conditions:

Time 0605:

- 90% power.
- "B" emergency diesel generator is tagged out for maintenance.

Time 0607:

- Normal feed breaker to Bus 1DA automatically trips open.
- All Main Feed Water pumps automatically trip.

Time 0610:

- Steam Generator (S/G) narrow range levels have decreased steadily after the trip to the following values:

  "A" S/G is 28%. "B" S/G is 40%. "C" S/G is 37%.

Which ONE of choices below completes the following statement?

At time 0610, **both** motor-driven EFW pumps ___(1)___ be running, and the turbine-driven EFW pump ___(2)___ be running.

ASSUME NO OPERATOR ACTIONS

	(1)	(2)
A.	will	will **not**
B.	will **not**	will **not**
C.	will	will
D.	will **not**	will

46. Which ONE of the choices below completes the following statements?

The **opening** force for IFV02030-MS, EF PUMP TURB STEAM SUPPLY FLOW CONT VLV, to permit TD EFW Pump operation is ___(1)___ .

IFV02030-MS ___(2)___ equipped with an attached air accumulator.

A. 1) spring pressure
   2) is

B. 1) spring pressure
   2) is **not**

C. 1) air pressure
   2) is

D. 1) air pressure
   2) is **not**

47. Which ONE of the choices below completes the following statements?

With the Turbine Driven (TD) EFW Pump in service with flow control valves closed, the pump's recirculation flow line directs flow back to the _____(1)_____ .

Per SOP-211, EMERGENCY FEEDWATER, operation of EFW pumps with flow control valves closed is limited to a **maximum** duration of ___(2)___ .

A. 1) suction of the TD EFW pump.
   2) 1 hour.

B. 1) suction of the TD EFW pump.
   2) 2 hours.

C. 1) Condensate Storage Tank.
   2) 1 hour.

D. 1) Condensate Storage Tank.
   2) 2 hours.

48. Initial Conditions:

- 100% power initially.
- All offsite power (115KV and 230KV) was lost.
- "A" and "B" Emergency Diesel Generators (EDGs) failed to start.

Current Conditions:

- EOP-6.0, LOSS OF ALL ESF AC POWER in progress.
- Operators have started the "A" EDG.

Which ONE of the choices below completes the following statements?

In accordance with a CAUTION in EOP-6.0, "A" EDG can be loaded up to a limit of __(1)__ KW for a seven (7) day period.

The "A" EDG fuel rack stop setting will prevent loading of that diesel in excess of __(2)__ KW.

A. 1) 4250
   2) 4760

B. 1) 4250
   2) 5100

C. 1) 4676
   2) 4760

D. 1) 4676
   2) 5100

49. Given the following plant conditions:

- 100% power.
- XCP-637, 4-5, DC SYS TRAIN B GND TRBL, unexpectedly alarms.
- In accordance with the appropriate ARP, an operator was dispatched to XPN5440 (IB-412).

Which ONE of the choices below completes the following statements?

The ground trouble alarm above ___(1)___ cause an automatic action (or actions).

XCP-637, 4-5 annunciates when the ground current setting in milliamperes for the alarm is met ___(2)___.

A. 1) does
   2) for a specified time delay in seconds.

B. 1) does
   2) **without** a time delay (immediately).

C. 1) does **not**
   2) for a specified time delay in seconds.

D. 1) does **not**
   2) **without** a time delay (immediately).

50. Given the following plant conditions:

- Operators are placing battery charger XBC1X-2X in service per SOP-311, 125 VDC SYSTEM, Section IV. M. PLACING BATTERY CHARGER XBC1X-2X IN SERVICE.
- The following breakers have just been closed on the front of XBC1X-2X:
  - CB2, DC OUPUT
  - CB1, AC INPUT

Which ONE of the choices below completes the following statement in accordance with SOP-311?

A note in SOP-311 specifically states that, to allow capacitors to fully charge and the battery charger to stabilize, an operator is required to wait at least ___(1)___ .

After that time has elapsed, then ___(2)___ .

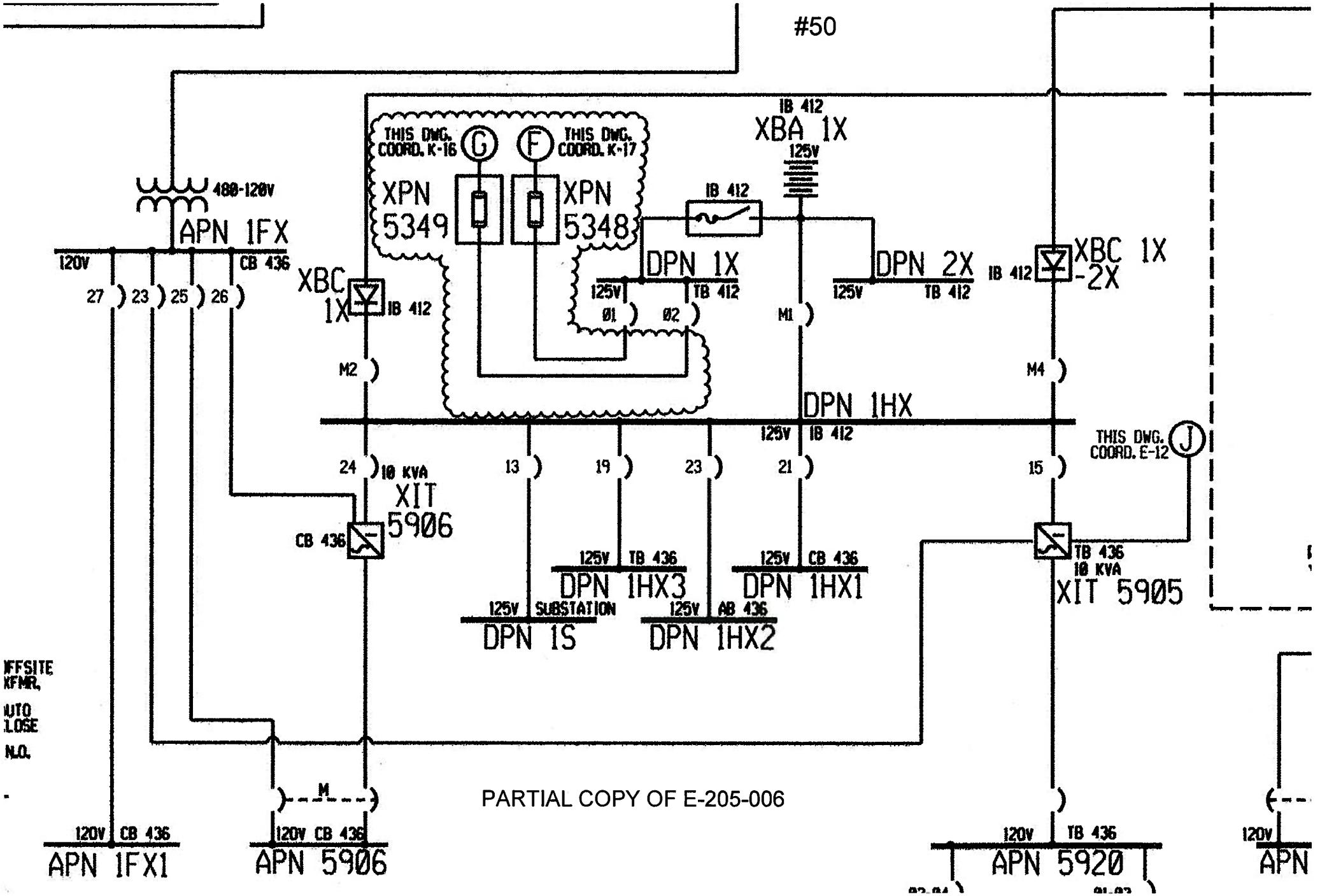
REFERENCE PROVIDED

A. 1) five to ten (5-10) seconds after closing CB1.
   2) 1DPN1HX M4 can be closed.

B. 1) five (5) minutes after closing CB1.
   2) 1DPN1HX M4 can be closed.

C. 1) five to ten (5-10) seconds after closing 1DPN1HX M4.
   2) 1DPN1HX M2 can be opened.

D. 1) five (5) minutes after closing 1DPN1HX M4.
   2) 1DPN1HX M2 can be opened.



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51. Given the following plant conditions:

- 100% power.
- An automatic Safety Injection (SI) occurred.
- Offsite power to bus 1DA was lost.
- The "A" Emergency Diesel Generator (EDG) automatically started and restored power to bus 1DA.
- The following annunciators are in alarm in the Control Room:
  - XCP-636, 1-2, HIGH LUBE OIL TEMPERATURE
  - XCP-636, 6-3, DG A ENG TEMP TRBL
- An operator reports the following local conditions at the "A" EDG.
  - XCX-5201, 1-2, HIGH LUBE OIL TEMPERATURE is in alarm.
  - Lube Oil Temperature is reading 180 °F and rising.
  - There is no Service Water flow to the "A" DG.

Which ONE of the choices below completes the following statement?

Based on the current conditions, DG "A" ____(1)____ have automatically tripped; and Fire Service Water __(2)_____ aligned to the DG "A" lube oil cooler.

A. 1) should
   2) must be manually

B. 1) should **not**
   2) must be manually

C. 1) should
   2) will be automatically

D. 1) should **not**
   2) will be automatically

52. Which ONE of the following sets of valves will re-position as indicated on a sensed Hi Radiation signal generated by detector RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR?

A. PVT-524, TO CW will close.
PVG-525, DIVERT TO NB will open.

B. PVT-524, TO CW will close.
PVG-525, DIVERT TO NB will close.

C. PVD-6121, NUC BLOWDOWN DISCHARGE will close.
PVG-525, DIVERT TO NB will close.

D. PVD-6121, NUC BLOWDOWN DISCHARGE will close.
PVG-525, DIVERT TO NB will open.

53. Given the following plant conditions:

- 100% power initially.
- A Large break LOCA occurs.
- A loss of 115 KV power occurred at the same time as the LOCA.

Which ONE of the choices below completes the following statements?

MOV XVB-3106A-SW, VLV ISOL REAC BLDG INLET A, the discharge isolation valve of the "A" Service Water Booster Pump, is supplied power **directly** from ___(1)___.

Three (3) minutes after the Large Break LOCA event occurs, MOV XVB-3106A-SW ___(2)___ be open.

ASSUME NO OPERATOR ACTIONS

A. 1) XMC1DA2Z
   2) will

B. 1) XMC1DA2X
   2) will

C. 1) XMC1DA2Z
   2) will **not**

D. 1) XMC1DA2X
   2) will **not**

54. Which ONE of the choices below completes the following statements?

During a refueling outage, Nitrogen __ (1)___ be aligned via permanently installed Nitrogen system piping to operate Main Steam Isolation Valves.

A MSIV is **closed** by ___(2)___ .

A. 1) can
   2) spring pressure acting on the associated valve stem.

B. 1) can
   2) air pressure applied to the associated operating cylinder.

C. 1) can **not**
   2) air pressure applied to the associated operating cylinder.

D. 1) can **not**
   2) spring pressure acting on the associated valve stem.

55. Given the following plant conditions:

- Mode 6
- Reactor Building Purge is in progress in accordance with SOP-114, REACTOR BUILDING VENTILATION SYSTEM.
- A circuit card malfunction of RM-A4, REACTOR BUILDING PURGE EXHAUST MONITOR, causes a spurious RM-A4 High Radiation Alarm.

NOTE:
XVB-1A, RB PURGE SUPPLY ISOLATION VALVE

XVB-1B, RB PURGE SUPPLY ISOLATION VALVE

XVB-2A, RB PURGE EXHAUST ISOLATION VALVE

XVB-2B, RB PURGE EXHAUST ISOLATION VALVE

Which ONE of the following identifies **all** the valves that automatically close **directly** from the spurious RM-A4 High Radiation Alarm?

A. **only** XVB-2A and XVB-2B

B. **only** XVB-1A and XVB-2A

C. **only** XVB-1B and XVB-2B

D. XVB-1A, XVB-1B, XVB-2A, and XVB-2B **all** close

56. Which ONE of the choices below completes the following statements?

The CRDM Cooling Water System includes the component FT75025, CRDM LEAK DETECTION DRAIN LINE FLOW TRANSMITTER associated with the CRDM Cooler inside containment that _____(1)_____ .

In the event of degraded CRDM Cooling Water System capacity, the system _____(2)_____ have the availability to be manually aligned to the Industrial Cooling Water System, in accordance with SOP-125, INDUSTRIAL COOLING WATER.

A. 1) generates an IPCS alarm to alert operators of potential RCS leakage.
   2) does

B. 1) generates an IPCS alarm to alert operators of potential RCS leakage.
   2) does **not**

C. 1) provides input to the RCS Leakrate Program to allow quantification of RCS leakage.
   2) does

D. 1) provides input to the RCS Leakrate Program to allow quantification of RCS leakage.
   2) does **not**

57. Given the following plant conditions:

Time 1200:

- 100% power.
- A review of calibration paperwork for Pressurizer Code Safety Valves was performed.
- The lift setpoints were determined to be as follows:

  2385 psig.
  2430 psig
  2485 psig

Which ONE of the choices below answers both of the following questions in accordance with T.S. 3.4.2.2, REACTOR COOLANT SYSTEM - OPERATING?

1) How many Pressurizer Code Safety Valves are currently OPERABLE?

2) Based on the given conditions, what is the **earliest** action required by T.S. 3.4.2.2, if any?

A. 1) 2
   2) No action is required.

B. 1) 3
   2) No action is required.

C. 1) 2
   2) restore the Inoperable valve to OPERABLE status within 15 minutes.

D. 1) 2
   2) restore the Inoperable valve to OPERABLE status within one (1) hour.

58. Given the following conditions:

- Unit 1 is returning to power following a refueling outage.
- Operators have taken the Reactor critical and have slowly raised power to 8%.
- Intermediate Range N-35 experienced a loss of **control power**.

Which ONE of the choices following completes the statements below?

The Intermediate Range N-35 High Flux trip bistable is in a ___(1)___ condition and an automatic Reactor Trip __(2)__ occurred.

A. 1) tripped
   2) has

B. 1) tripped
   2) has **not**

C. 1) **non**-tripped
   2) has

D. 1) **non**-tripped
   2) has **not**

59. Which ONE of the choices below completes the following statements?

PT-446, TURBINE 1ST STAGE PRESSURE, ___(1)___ provide an input to an actuation circuit required by T.S. 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION.

The PT-446 circuit ___(2)___ use an isolation amplifier to separate control functions and protection functions that utilize its output.

A. 1) does
   2) does

B. 1) does
   2) does **not**

C. 1) does **not**
   2) does

D. 1) does **not**
   2) does **not**

60. Given the following plant conditions:

- Mode 6.
- A leak has begun on the suction of the in-service Spent Fuel Cooling Pump (at the 454' elevation).
- LI-7431, POOL LEVEL, and LI-7433, POOL LEVEL, both currently indicate 461' – 3" and slowly lowering.

Which of the choices below answer both of the following question?

1) Are both XCP-608 1-2, SFP LVL HI/LO, and XCP-609 1-2, SFP LVL HI/LO currently in alarm?

2) Which of the elevations listed below is **closest** to the expected level to which the Spent Fuel Pool will drain due to the leak?

ASSUME NO OPERATOR ACTIONS

A. 1) No.
   2) 454'

B. 1) Yes.
   2) 454'

C. 1) No.
   2) 460'

D. 1) Yes.
   2) 460'

61. Given the following:

- Unit 1 is in MODE 6 performing a core re-load.
- The JOG PERMISSIVE switch is OFF.

Based on the given conditions, which ONE of the following would render the manipulator crane bridge **and** trolley inoperative simultaneously?

A. The trolley bypass is engaged.

B. The hoist is being operated or the gripper tube is down.

C. The Reactor Building Upender is in the vertical position (FRAME UP).

D. The Manipulator load cell indicates 100 pounds more than the fuel assembly.

62. Given the following plant conditions:

Time 1000:

- 100% power.
- Charging Pump "A" is in service.

Time 1010:

- Pressurizer level is falling.
- VCT level is rising.
- XCP-614, Annunciator Point 5-1, CHG LINE FLO HI/LO is in alarm.
- XCP-614, Annunciator Point 5-2, SL WTR INJ FLOW LO is in alarm.
- XCP-613, Annunciator Point 1-4, REGEN HX LTDN OUT TEMP HI is in alarm.

Which ONE of the following events has occurred to cause the conditions at 10:10?

A. Charging Pump "A" has tripped.

B. FCV-122, CHG FLOW, has failed CLOSED.

C. PCV-145, LO PRESS LTDN, has failed OPEN.

D. A **spurious** automatic charging pump suction transfer to the RWST has occurred.

63. Which ONE of the following buses **directly** provides power to Service Water Pump "C" (XPP-0039C) when aligned to Service Water Loop "B" per SOP-117, SERVICE WATER SYSTEM?

A. 7200 V bus 1EA

B. 7200 V bus 1EB

C. 7200 V bus 1DB

D. 7200 V bus 1C

64. Given the following plant conditions:

- 100% power.
- A failure of the in-service air compressor, XAC-3A occurs.
- Instrument Air pressure is currently 88 psig and lowering.
- All Main Steam Isolation Valves are fully open.
- No Feedwater Flow Control valve is closed.
- No other significant erratic valve operation is noted.

Which ONE of the following completes the below statements?

Instrument Air Header Pressure ___(1)___ lowered to less than automatic start setpoint of the Standby Instrument Air Compressor. (XAC-3B) Michael Marks 05/20/2015

If valve positions do not change, the Reactor is required to be manually tripped as soon as Instrument Air Header pressure is LESS THAN __(2)___ psig in accordance with AOP-220.1, LOSS OF INSTRUMENT AIR.

ASSUME NO OPERATOR ACTIONS

A. 1) has
   2) 50

B. 1) has **not**
   2) 50

C. 1) has
   2) 55

D. 1) has **not**
   2) 55

65. Given the following plant conditions:

Time 10:00:

- 100% power.
- **Neither** the electric, nor the diesel fire pump is running.
- Fire header pressure is 112 psig.

Time 10:05:

- A plant fire is reported.
- A Reactor Trip has been initiated.
- Fire header pressure is 98 psig.

Time 10:05 **and 15 seconds**:

- XSW1C2 is deenergized.
- Fire service water header pressure is 90 psig.

Time 10:06:

- XSW1C2 is still deenergized.
- Fire service water header pressure is 90 psig.

Which ONE of the choices below completes the following statements?

At Time **10:05:00**, the **electric** fire pump ___(1)___ running.

At Time **10:06:00**, the **diesel** fire pump ___(2)___ running.

ASSUME NO OPERATOR ACTIONS

A. 1) is
   2) is

B. 1) is **not**
   2) is

C. 1) is
   2) is **not**

D. 1) is **not**
   2) is **not**

66. Given the following plant conditions:

- Unit 1 is in a refueling outage.
- Non-licensed operators report that they are unable to complete a Lockout-Tagout of a condensate isolation valve in the gland sealing system because the valve is leaking by.
- In accordance with OAP-100.5, GUIDELINES FOR CONFIGURATION CONTROL AND OPERATION OF PLANT EQUIPMENT, permission is obtained from the Shift Supervisor (SS) to use the appropriate sized valve wrench, the leakage is stopped, and the tagout is completed.

Based on the given conditions, operators are required to enter the affected valve in the ___(1)___ Log.

In addition to entering the affected valve in the above log, operators ___(2)___ also **required** to generate **both** a Work Order and a Condition Report describing the details surrounding the need to use a valve wrench on the affected valve.

Which ONE of the following choices completes the above statements, in accordance with OAP-100.5?

A. 1) R&R
   2) are

B. 1) R&R
   2) are **not**

C. 1) Equipment Misalignment Status
   2) are

D. 1) Equipment Misalignment Status
   2) are **not**

67. Given the following plant conditions:

- Mode 6.
- Fuel assemblies are being moved into the Reactor Vessel.

Which ONE of the following conditions would **not** require stopping the reload of fuel assemblies into the reactor vessel in accordance with V.C. Summer Technical Specifications?

A. The result of the latest RCS boron sample is 1900 ppm.

B. The Excore Nuclear Instrument Audio Countrate circuit is lost.

C. The NROATC is the only licensed operator in the Control Room.

D. Communications are lost between the Control Room and the Reactor Building.

68. Given the following conditions:

- 100% power for the last 45 days.
- A NROATC has worked the following schedule:

NOTE: The times listed below do **not** include turnover time.

4/23 to 4/26 – OFF

4/27 – 0700 to 1900

4/28 – OFF

4/29 – 0700 to 1900

4/30 – 0700 to 2030

5/1 – 0600 to 1900

5/2 – OFF

5/3 – 1000 to 2100

5/4 – 0400 to 1730

5/5 – OFF

- No special accommodations were granted to the NROATC.

In accordance with SAP-152, FATIGUE MANAGEMENT AND WORK HOUR LIMITS, the **first** work hour limit reached by the NROATC was at _____ .

Which ONE of the following completes the statement above?

A. 0600 on 5/1

B. 1900 on 5/1

C. 0400 on 5/4

D. 0900 on 5/4

69. Given the following Conditions:

- MODE 3
- Rod drop time testing is in progress in accordance with Surveillance 4.1.3.4 to satisfy T.S. LCO 3.1.3.4, ROD DROP TIME.

Which ONE of the choices below completes the following statement?

In accordance with the TS 3.1.3.4., ROD DROP TIME, the rod drop time must be met with T_{AVG} greater than or equal to ___(1)___ and a **minimum** of ___(2)___ Reactor Coolant Pumps operating.

A. 1) 500 °F
   2) two (2)

B. 1) 551 °F
   2) two (2)

C. 1) 500 °F
   2) three (3)

D. 1) 551 °F
   2) three (3)

70. Given the following plant conditions:

- Mode 3.
- A Lockout-Tagout is being hung on the "A" Feedwater Booster Pump for maintenance.
  - A Red Danger Tag has just been attached to the **pump motor breaker**.

Which ONE of the choices below completes the following statements?

In accordance with SAP-201, EQUIPMENT TAGGING AND LOCKOUT-TAGOUT, a ____(1)____ was placed on the "A" Feedwater Booster Pump control switch in the Control Room.

In accordance with OAP-100.5, GUIDELINES FOR CONFIGURATION CONTROL AND OPERATION OF PLANT EQUIPMENT, the **next** Red Danger Tag that is required to be hung, after the pump motor breaker, will be on the ____(2)_____.

A. 1) Hold tag
   2) discharge valve.

B. 1) Hold tag
   2) suction valve.

C. 1) Caution tag
   2) discharge valve.

D. 1) Caution tag
   2) suction valve.

71. Which ONE of the choices below completes the following statements?

EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION, requires that operators reduce Control Room emergency ventilation to <u>one</u> train in operation within a MAXIMUM of ___(1)___ of actuation.

Control Room emergency ventilation is designed such that access to and occupancy of the Control Room under accident conditions and for the duration of the accident does not result in personnel exposures in excess of a **<u>maximum</u>** ___(2)___ whole body.

A. 1) 30 minutes
   2) 10 Rem

B. 1) 30 minutes
   2) 5 Rem

C. 1) one hour
   2) 10 Rem

D. 1) one hour
   2) 5 Rem

72. Given the following plant conditions:

- Operators will be performing work in the room containing **"B"** RHR Heat Exchanger on AB-412'.

Which one of the choices below completes the following statements?

The highest **level of contamination** in the room in which the work will be performed, based on survey readings, was found ____(1)_____

The highest **contact reading** indicated in the room in which work will be performed, based on survey readings, is __(2)__ mrem/hr.

REFERENCE PROVIDED

A. 1) by the end of the "B" RHR heat Exchanger closest to the entrance.
   2) 175

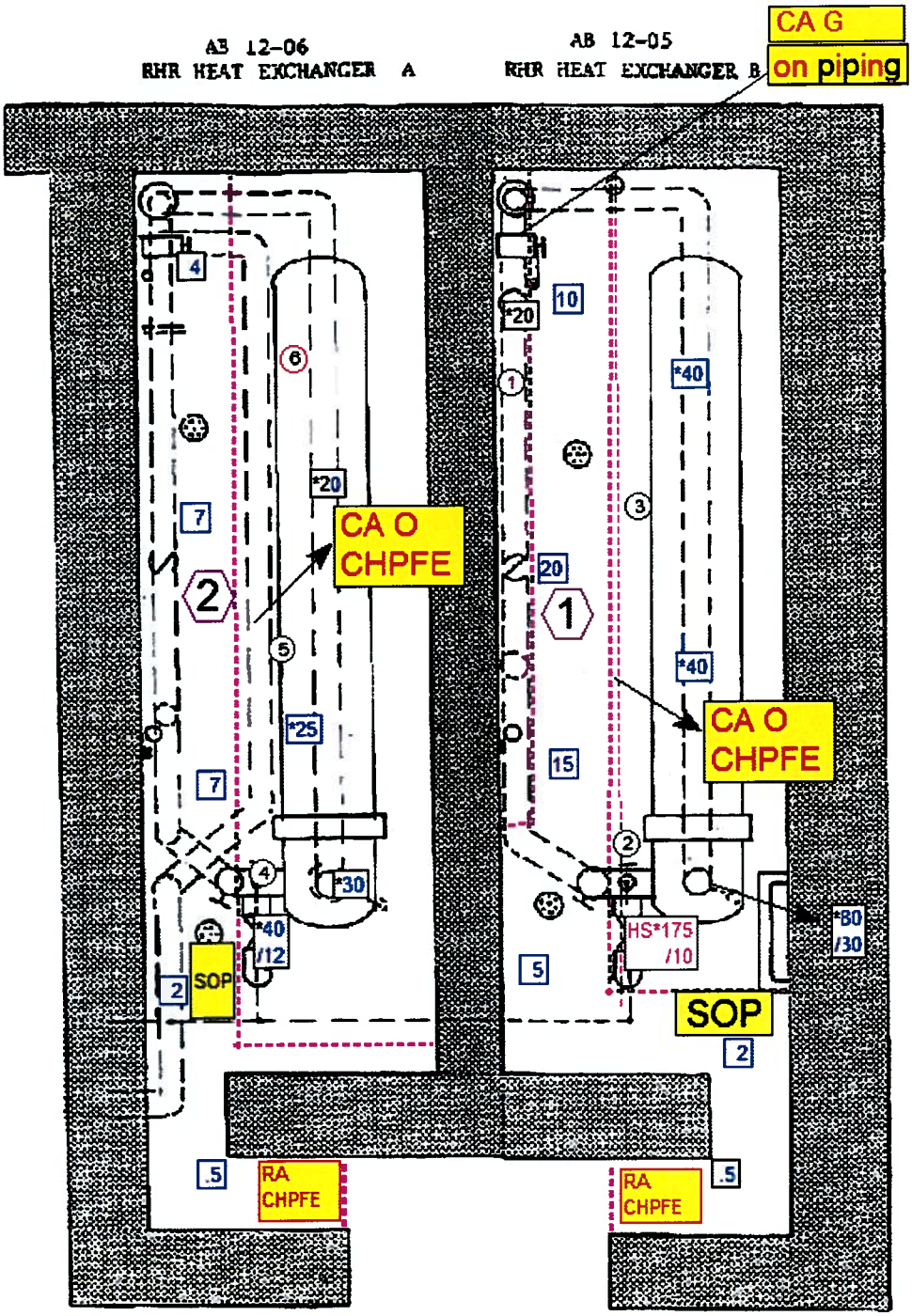
B. 1) by the end of the "B" RHR heat Exchanger closest to the entrance.
   2) 40

C. 1) on piping in the area of AB 12-05 farthest from the entrance to the room.
   2) 175

D. 1) on piping in the area of AB 12-05 farthest from the entrance to the room.
   2) 40

#72

AB 412-05, 06



Contamination in DPM/100cm²						Counter: Ludlum-177 Ser.# 266933	Inst. Type: Telepole Ser.# 6696-023
1	2000	6	<1000	11	N/A	Counter: N/A Ser.# N/A	
2	5000	7	N/A	12	N/A		Surveyed by: HP Tech
3	2000	8	N/A	13	N/A	Bkg. = 100 CPM	Time: 12:00 Date: 12/19/14
4	20000	9	N/A	14	N/A	⬡ =Sweeps = Bkg.	Reviewed by: HP Shift Leader
5	<1000	10	N/A	15	N/A		Time: 13:59 Date: 12/19/14
* Denotes contact reading. All readings in mR/hr unless otherwise noted.							

73. Given the following plant conditions:

Time 03:45

- A LOCA has occurred.

Time 0400:

- Containment radiation level is 1200 R/hr and increasing slowly.
- Containment pressure is 2.8 psig and increasing.
- IPCS is **not** available, and engineering can **not** determine integrated dose.

Time 0600:

- Containment radiation level is 900 R/hr and decreasing slowly.
- Containment pressure peaked at 12 psig, and is now 2.8 psig and decreasing.
- IPCS is **not** available, and engineering can **not** determine integrated dose.

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

At 0400, adverse containment setpoint values ___(1)___ required to be used in the Emergency Operating Procedures (EOPs) for designated parameters.

At 0600, adverse containment setpoint values ___(2)___ required to be used in the EOPs for designated parameters.

A. 1) are
   2) are

B. 1) are
   2) are **not**

C. 1) are **not**
   2) are

D. 1) are **not**
   2) are **not**

74. Given the following plant conditions:

- The control room was evacuated due to a fire in the Main Control Board.
- The crew is implementing FEP-4.0, CONTROL ROOM EVACUATION DUE TO FIRE.
- The reactor has been tripped.
- All actions of FEP-4.0, Enclosure B, DUTIES OF THE REACTOR OPERATOR are complete.
- The Control Room Evacuation Panel (CREP) has been manned.

Based on the given conditions, which ONE of the following statements identifies how RCS pressure will be controlled in accordance with FEP-4.0?

A. Group 1 pressurizer backup heaters will be cycled locally at XSW 1DA.

B. Group 2 pressurizer backup heaters will be cycled locally at XSW 1DB.

C. Group 1 pressurizer backup heaters will be continuously energized at XSW 1DA.

D. Group 2 pressurizer backup heaters will be continuously energized at XSW 1DB.

75. Initial conditions:

- A SITE AREA EMERGENCY (SAE) has been declared.
- The time for the initial notifications to all appropriate offsite agencies is 1000.

Current conditions:

- At 1030, the Emergency Director (ED) declared an upgrade to a General Emergency.

Which ONE of the choices below completes the following statements?

Based on the current conditions, the **next** notification to be provided to state and local governments is required by ___(1)___ .

EPP-02, COMMUNICATION AND NOTIFICATION, states that the Emergency Response Data System (ERDS) must be activated as soon as possible, but not greater than one hour from the declaration of an ___(2)___ or higher emergency classification.

A. 1) 1045
   2) Unusual Event

B. 1) 1045
   2) Alert

C. 1) 1100
   2) Unusual Event

D. 1) 1100
   2) Alert

ANSWER KEY REPORT

for 2015 NRC Exam FINAL AS GIVEN Test Form: 0

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

ANSWER KEY REPORT

for 2015 NRC Exam FINAL AS GIVEN Test Form: 0

#	Answers 0
47	D
48	C
49	C
50	A
51	D
52	A
53	B
54	D
55	B
56	B
57	C
58	A
59	A
60	C
61	B
62	A
63	B
64	A
65	B
66	C
67	C
68	A
69	D
70	A
71	B
72	A
73	A
74	B
75	B
76	B
77	A
78	C
79	D
80	A
81	B
82	A
83	A
84	C
85	D
86	C
87	B
88	B
89	D
90	D
91	B
92	A

ANSWER KEY REPORT

for 2015 NRC Exam FINAL AS GIVEN Test Form: 0

#	Answers 0
93	D
94	D
95	C
96	D
97	B
98	C
99	A
100	C