ML23221A326

Form 4.2-4 Senior Reactor Operator Written Examination Cover Sheet

U.S. Nuclear Regulatory Commission
Senior Reactor Operator Written Examination

Applicant Information	
Name:	
Date:	Facility/Unit: Farley 1&2
Region: I ☐ II ■ III ☐ IV ☐	Reactor Vendor/Type: Westinghouse
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 percent overall, with 70 percent or better on the senior reactor operator (SRO)-only items if given in conjunction with the reactor operator (RO) exam; SRO-only exams given alone require a final grade of 80 percent to pass. You have 9 hours to complete the combined examination and 3 hours if you are only taking the SRO-only 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 Points	_____ / _____ / _____ Points
Applicant's Points	_____ / _____ / _____ Points
Applicant's Grade	_____ / _____ / _____ Percent

EQUATIONS

$\dot{Q} = \dot{m}c_p\Delta T$

$\dot{Q} = \dot{m}\Delta h$

$\dot{Q} = UA\Delta T$

$\dot{Q} \propto \dot{m}^3_{\text{Nat Circ}}$

$\Delta T \propto \dot{m}^2_{\text{Nat Circ}}$

$K_{eff} = 1/(1-\rho)$

$\rho = (K_{eff} - 1)/K_{eff}$

$SUR = 26.06/\tau$

$$\tau = \frac{\bar{\beta}_{eff} - \rho}{\lambda_{eff}\ \rho}$$

$$\rho = \frac{\ell^*}{\tau} + \frac{\bar{\beta}_{eff}}{1 + \lambda_{eff}\ \tau}$$

$\ell^* = 1.0 \times 10^{-4}$ sec

$\lambda_{eff} = 0.1\ \text{sec}^{-1}$ (for $\rho > 0$)

$DRW \propto \varphi^2_{tip}/\varphi^2_{avg}$

$P = P_o e^{t/\tau}$

$P = P_0 10^{SUR(t)}$

$A = A_o e^{-\lambda t}$

$N = S/(1 - K_{eff})$

$CR_1(1 - K_{eff_1}) = CR_2(1 - K_{eff_2})$

$1/M = CR_1/CR_x$

$A = \pi r^2$

$F = PA$

$\dot{m} = \rho A\vec{v}$

$\dot{W}_{Pump} = \dot{m}\Delta P\upsilon$

$P = I^2R$

$P = IE$

$P_A = \sqrt{3}IE$

$P_T = \sqrt{3}IEpf$

$P_R = \sqrt{3}IE\sin\theta$

Thermal Efficiency = Net Work Out/Energy In

$$\frac{g(z_2 - z_1)}{g_c} + \frac{(\vec{v}_2^2 - \vec{v}_1^2)}{2g_c} + \upsilon(P_2 - P_1) + (u_2 - u_1) + (q - w) = 0$$

$g = 32.2\ \text{ft/sec}^2$

$g_c = 32.2$ lbm-ft/lbf-sec^2

CONVERSIONS

1 MW = 3.41 x 10^6 Btu/hr

1 hp = 2.54 x 10^3 Btu/hr

1 Btu = 778 ft-lbf

°C = (5/9)(°F − 32)

°F = (9/5)(°C) + 32

1 kg = 2.21 lbm

1 ft^3_{water} = 7.48 gal

1 gal_{water} = 8.35 lbm

1 Curie = 3.7 x 10^{10} dps

1. Given the following:
   - Unit 1 has been shutdown for 30 days due to a forced outage.

   Subsequently,
   - Reactor power was raised to 50% over a 5 hour period.
   - Reactor power was then held at 50% for 24 hours.

   Which one of the following completes the statements below?

   __(1)__ is the plot of the concentration of Xe over this 29 hour period of operational history.

   The reason for the reactivity change is due to __(2)__.

Reference Provided

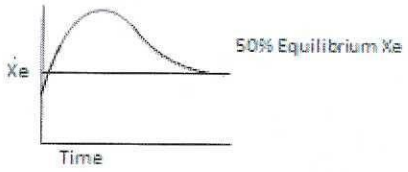
A. (1)

(2) removal by burnout at higher power

B. (1)

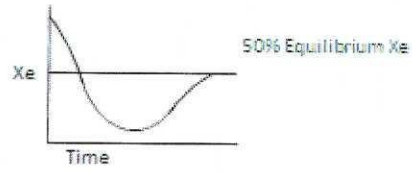
(2) production by both fission and decay of I-135

C. (1)



(2) removal by burnout at higher power

D. (1)



(2) production by both fission and decay of I-135

2. Given the following:

- Unit 2 is operating at 100% power.
- Core age is 10,000 MWD/MTU in Middle of Life (MOL) .
- Reactor Engineering has determined maximum End of Life (EOL) burnout for this cycle is 20215 MWD/MTU.

Which one of the following completes the statement below?

Over the next 3 months, RCS boron concentration must be periodically __(1)__ due to __(2)__.

A. (1) RAISED

(2) depletion of installed burnable poisons

B. (1) RAISED

(2) to ensure adequate Shutdown Margin (SDM) to compensate for changes in differential rod worths at this time in core life

C. (1) LOWERED

(2) buildup of fission product poisons ONLY

D. (1) LOWERED

(2) fuel depletion and buildup of fission product poisons

3. Given the following:

- Unit 1 has been shutdown for 5 hours after 200 days at 100% power.

Which one of the following completes the statements below?

The magnitude of decay heat being generated at this time is approximately equivalent to _(1)_ of the Reactor thermal output.

The magnitude of decay heat being generated is **primarily** due to _(2)_.

	(1)	(2)
A.	1%	power history
B.	1%	time in core life
C.	7%	power history
D.	7%	time in core life

4. Given the following:

   - 50 lbm of a saturated steam-water mixture with an inlet quality of 40 percent is flowing through the 1A SG moisture separator.
   - The 1A SG moisture separator is 99.9 percent efficient for removing water.

   Which one of the following completes the statements below?

   Approximately ___ of **liquid** will be removed by the moisture separator from the steam-water mixture.

   A. 9.99 lbm

   B. 19.98 lbm

   C. 29.97 lbm

   D. 39.96 lbm

5. Given the following:

   - Unit 2 is operating at 100%.

Which one of the following completes the statements below?

Lowering Circulating Water inlet temperature will _(1)_ Condensate Depression.

Evaluating **only** the change in Condensate Depression you selected above, the overall plant **thermal** efficiency will _(2)_.

For the purposes of this question, consider the Secondary Plant as an ideal Rankine/Steam Cycle

	(1)	(2)
A.	RAISE	LOWER
B.	RAISE	RISE
C.	LOWER	LOWER
D.	LOWER	RISE

6. Given the following:

- Unit 1 is operating at 100% power.

At 1000:

- Control Rod H-2 has repositioned to 80 steps.
- All other rods are at 228 steps.
- Rod H-2 has been verified to be moveable.

At 1200:

- The Unit is still at power.

Which one of the following completes the statements below for plant conditions **at 1200**, and considering they do not change in the future?

Axial Flux Distribution (AFD) for the channel **nearest** the misaligned rod is _(1)_ than the other channels.

The long term concern for the current plant configuration is _(2)_.

A. (1) LESS negative

(2) Tech Spec requirements for Rod Insertion Limits will be violated

B. (1) MORE negative

(2) Tech Spec requirements for Rod Insertion Limits will be violated

C. (1) LESS negative

(2) rod recovery will result in localized power peaking

D. (1) MORE negative

(2) rod recovery will result in localized power peaking

7. Given the following:

- Unit 1 is operating at approximately 75% and stable.
- Rod control is in MANUAL.
- Pressurizer level is stable.

Subsequently,

- A Continuous Rod Withdrawal event occurs.

Which one of the following completes the statements below?

With no operator action(s), Pressurizer level initially _(1)_.

Per AOP-19, Malfunction of Rod Control System, the **first** action(s) the operating crew is(are) required to perform is(are) _(2)_.

A. (1) LOWERS

(2) trip the reactor and enter EEP-0, Reactor Trip or Safety Injection

B. (1) LOWERS

(2) place the rod control mode selector switch to AUTO and check rod motion has stopped when Tavg / Tref mismatch is within limits.

C. (1) RISES

(2) trip the reactor and enter EEP-0, Reactor Trip or Safety Injection

D. (1) RISES

(2) place the rod control mode selector switch to AUTO and check rod motion has stopped when Tavg / Tref mismatch is within limits.

8. Given the following:

At 1000:

- Unit 1 is operating at 25%.

At 1005:

- 1A RCP trips.

Which one of the following completes the statements below if no operator actions occur after the 1A RCP trip?

At time **1006**, 1A SG pressure will be _(1)_ than the 1A SG pressure at time **1000**.

At time **1006**, steam flows from the1B and 1C SGs will be _(2)_ than the steam flows from the 1B and 1C SGs at time **1000**.

	(1)	(2)
A.	HIGHER	LOWER
B.	HIGHER	HIGHER
C.	LOWER	LOWER
D.	LOWER	HIGHER

9. Given the following:

   - Unit 1 is operating at 100% power.

   Subsequently,

   - TK-144, LTDN HX OUTLET TEMP, **controller**, demand fails **low** (0%).

   Which one of the following completes the statements below?

   With no operator action, TCV-143, LTDN HI TEMP DIVERT VALVE, __(1)__ automatically divert.

   The failure will result in a slight __(2)__ of the RCS before operator actions occur.

	(1)	(2)
A.	will NOT	dilution
B.	WILL	dilution
C.	will NOT	boration
D.	WILL	boration

10. Given the following:

- Unit 1 is operating at 10% and ramping up after a refueling outage.

Which one of the following completes the statements below per UOP-3.1, Power Operation?

After a change in RCS boron concentration, Pressurizer Backup heaters are _(1)_ and Pressurizer Spray Valves are _(2)_.

A. (1) left in AUTO

(2) placed in MANUAL with both spray valves throttled open to initiate spray flow

B. (1) left in AUTO

(2) left in AUTO

C. (1) placed in ON

(2) placed in MANUAL with both spray valves throttled open to initiate spray flow

D. (1) placed in ON

(2) left in AUTO

11. Given the following on Unit 1:

- The operating crew is evaluating the precautions and limitations to place RHR in service per SOP-7.0, Residual Heat Removal System.
- All conditions are met to allow the opening of MOV-8701A, 1C RCS LOOP TO 1A RHR PUMP, **except** Pressurizer vapor space temperature.

Which one of the following completes the statement below per SOP-7.0?

Pressurizer vapor temperature must be less than a **maximum** of ____ to open MOV-8701A.

A. 480°F

B. 475°F

C. 370°F

D. 340°F

12. Given the following:

- Unit 1 is operating at 85% power.
- FF1, ROD CONT SYS URGENT FAILURE, alarms.
- FF5, COMP ALARM ROD SEQ/DEV OR PR FLUX TILT, alarms.
- The following is observed:
  - Control Bank 'D' step counters indicate 188 steps.
  - Control Bank 'D' rod H2 DADS indicates 174 steps.
  - All other Control Bank 'D' rods indicate 192 steps on DADS.

Subsequently,

- Maintenance has determined that rod H2 is trippable.

Which one of the following completes the statements below?

After the maintenance determination, entry in to a REQUIRED ACTION statement of LCO 3.1.4, Rod Group Alignment Limits, __(1)__ required.

Per AOP-19, Malfunction of Rod Control System, the operating crew __(2)__ required to reduce power.

	(1)	(2)
A.	is NOT	is NOT
B.	is NOT	IS
C.	IS	is NOT
D.	IS	IS

13. Given the following:

- Unit 1 is in Mode 6.
- The RCS level is at midloop.
- Both RHR pumps are in operation.
- Low Pressure Letdown is in service on A Train.

At 1000:

The 1A RHR pump is in the following configuration:
- HIK-603A, 1A RHR HX DISCH VLV, is 0%.
- FK-605A, 1A RHR HX BYP FLOW, is in manual with 75% demand.

The 1B RHR pump is in the following configuration:
- HIK-603B, 1B RHR HX DISCH VLV, is 50%.
- FK-605B, 1B RHR HX BYP FLOW, is in manual with 25% demand.

At 1005:

- 1A RHR pump trips.

Which one of the following completes the statements below if no operator actions occur after the 1A RHR pump trip?

At time **1006**, RCS level is _(1)_ than RCS level at time **1000**.

At time **1006**, RCS temperature is _(2)_ than RCS temperature at time **1000**.

A. (1) GREATER than

(2) GREATER than

B. (1) GREATER than

(2) approximately the SAME as

C. (1) approximately the SAME as

(2) GREATER than

D. (1) approximately the SAME as

(2) approximately the SAME as

14. Which one of the following completes the statement below?

The power supply to MOV-8803A, HHSI TO RCS CL ISO, is ____.

A. MCC 1A

B. MCC 1T

C. MCC 1U

D. MCC 1V

15. Given the following:

- A small break LOCA has occurred on Unit 1.
- EEP-0, Reactor Trip or Safety Injection, is in progress.
- All RCPs are running.
- Containment pressure is 10 psig.
- Sub Cooled Margin Monitor is indicating 38°F.
- RCS pressure is 650 psig and lowering.
- There are **no** Charging pumps running.

Which one of the following completes the statement below?

The RHR pumps _(1)_ providing core cooling.

RCPs must _(2)_.

	(1)	(2)
A.	are NOT	remain operating
B.	are NOT	be tripped
C.	ARE	remain operating
D.	ARE	be tripped

16. Which one of the following completes the statement below?

The 1A RHR pump suction relief valve __(1)__ discharge to the PRT.

The PRT rupture discs are designed to rupture if the pressure in the PRT exceeds a **minimum** setpoint of __(2)__.

	(1)	(2)
A.	does NOT	100 psig
B.	does NOT	150 psig
C.	DOES	100 psig
D.	DOES	150 psig

17. Given the following:

- A complete loss of Offsite power has occurred on Unit 2.

Subsequently,

- ESP-0.1, Reactor Trip Response, is in progress.
- An operator is performing Attachment 2, Verifying 4160V Busses Energized.
- The following is observed:
  - The 2C Service Air Compressor will not start.

Which one of the following completes the statements below ?

Per ESP-0.1, the _(1)_ Service Air Compressor is the next to be used to supply Instrument air.

Alignment of the AC distribution system at the EPB _(2)_ required to be able to start the Service Air Compressor selected above.

	(1)	(2)
A.	2A	is NOT
B.	2A	IS
C.	2B	is NOT
D.	2B	IS

18. Given the following:

- Unit 1 was operating at 100% power.

Subsequently,

- An automatic Reactor trip occurred.
- Safety Injection did not actuate.
- The following indications are observed:
  - RCS pressure is 1030 psig and slowly lowering.
  - Pressurizer level is 93% and rising.
  - RVLIS is indicating 0% UPPER HEAD.

Which one of the following completes the statements below?

A _(1)_ break has occurred.

The INVENTORY Critical Safety Function Status Tree _(2)_ YELLOW.

	(1)	(2)
A.	Pressurizer Steam	IS
B.	Pressurizer Steam	is NOT
C.	RCS Loop	IS
D.	RCS loop	is NOT

19. Given the following:

- Unit 1 is operating at 100% power.
- 'A' Train is on service.

Subsequently,

- DG15, 1B S/U XFMR to 1G 4160 V bus BKR, trips open.
- 1B DG does **not** start.

Which one of the following completes the statements below?

RCPs _(1)_ lose CCW cooling.

The Letdown Heat Exchanger _(2)_ lose CCW cooling.

	(1)	(2)
A.	did NOT	did NOT
B.	did NOT	DID
C.	DID	did NOT
D.	DID	DID

20. Given the following:

- A Small break LOCA occurred on Unit 2.
- Containment pressure **peaked** at 12 psig.
- The lowest subcooling was 48°F.

Subsequently,

- A complete loss of Offsite power occurs.
- ESP-1.2, Post LOCA Cooldown and Depressurization, is in progress.
- The operating crew is at the step "Determine minimum required RCS subcooling for stopping one charging pump AND proceed to step 16.3"
- The following is reported by the OATC:
  - Subcooling is 86°F.
  - Containment pressure is 7 psig slowly lowering.

Which one of the following completes the statements below?

Current conditions _(1)_ adequate to stop a running Charging pump.

Per FNP-0-ESB-1.2, Post LOCA Cooldown and Depressurization Plant Specific Background Information, SI flow must be reduced at this step when conditions are met to _(2)_.

Reference Provided

A. (1) ARE

(2) minimize the loss of coolant from the primary system

B. (1) ARE

(2) conserve RWST inventory during primary system cooldown

C. (1) are NOT

(2) minimize the loss of coolant from the primary system

D. (1) are NOT

(2) conserve RWST inventory during primary system cooldown

21. Given the following:

- A Reactor trip has occurred on Unit 2.
- 2A, 2B and 2C 4160V busses were deenergized.

Subsequently,

- The crew is in ESP-0.1, Reactor Trip Response, at the step to "Check if RCP(s) should be reconfigured to optimize RCS flow and pressurizer spray performance. " and the following is observed:
  - 2A, 2B, and 2C 4160V busses have been re-energized.
  - All RCP support conditions have been met.

Which one of the following completes the statement below?

Per ESP-0.1, the operating crew is directed to first start the _____.

A. 2A RCP ONLY

B. 2B RCP ONLY

C. 2C RCP ONLY

D. 2A RCP and 2C RCP

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

C-1, IR HiØ Rod stop, is active when the proper number of Intermediate Range NIs exceed a **minimum** of _(1)_.

When active, C-1 will **prevent** rod withdrawal in _(2)_.

A. (1) current equivalent to 20% Reactor power

(2) MANUAL **and** AUTOMATIC

B. (1) current equivalent to 20% Reactor power

(2) AUTOMATIC **only**

C. (1) current equivalent to 15% Reactor power

(2) MANUAL **and** AUTOMATIC

D. (1) current equivalent to 15% Reactor power

(2) AUTOMATIC **only**

23. Given the following:

- Unit 1 is operating at 100% power.

Which one of the following completes the statements below?

Safety Injection Actuation occurs when _(1)_ of the associated Containment pressure transmitters reach the required setpoint.

Containment Spray Actuation occurs when _(2)_ of the associated Containment pressure transmitters reach the required setpoint.

	(1)	(2)
A.	2 of 3	2 of 3
B.	2 of 3	2 of 4
C.	2 of 4	2 of 3
D.	2 of 4	2 of 4

24. Given the following:

- Unit 1 was at 100% power.

At 1000:

- A Loss of all Offsite Power occurs.

At 1020:

- The following conditions exist:
  - RCS pressure is 2235 psig and steady.
  - RCS Loop THOT in all 3 loops is 595°F and decreasing slowly.
  - RCS Loop TCOLD in all 3 loops is 551°F and steady.
  - Core exit TCs indicate approximately 600°F and decreasing slowly.
  - Steam Generator pressures are approximately 1038 psig and steady.

Which one of the following completes the statement below?

Based on the conditions at **1020**, Natural Circulation _(1)_ exist.

Based on the given conditions, the _(2)_ would be used to release steam if necessary.

Reference Provided

	(1)	(2)
A.	does NOT	Steam Dumps
B.	DOES	Steam Dumps
C.	does NOT	SG Atmospheric Relief Valves
D.	DOES	SG Atmospheric Relief Valves

25. Based on the table of parameters below, which one of the following listed times is the **earliest** time that the Anticipated Transient Without Trip (ATWT) Mitigation System Actuation Circuitry (AMSAC) would be actuated?

Note: in the analysis for this question consider that all parameters in the below table all change in a continuous linear fashion between the stated times.

TIME	ALL SG NR LEVELS	PT-2446	PT-2447
0700	28%	44%	45%
0705	11%	42%	43%
0710	9%	40%	41%
0715	7%	38%	39%

A. 0700

B. 0705

C. 0710

D. 0715

26. Given the following:

- A loss of all AC has occurred on Unit 2.
- ECP-0.0, Loss of all AC Power is in progress.
- Attachment 4, RCP Seal Isolation, has been performed.

Subsequently,

- AC power has been restored.
- ECP-0.1, Loss of all AC Power Without SI Required, has been entered.

Which one of the following completes the statements below?

If Seal injection is **not** isolated prior to starting a Charging pump, it will result in potential thermal shock of the _(1)_.

Cooling of the RCP seals is accomplished by _(2)_.

A. (1) RCP thermal barriers

(2) slowly throttling open MOV-3052, CCW TO RCP CLRS, locally after Charging has been restored

B. (1) RCP thermal barriers

(2) natural circulation cooldown of the plant

C. (1) RCP Seals

(2) slowly throttling open MOV-3052, CCW TO RCP CLRS, locally after Charging has been restored

D. (1) RCP Seals

(2) natural circulation cooldown of the plant

27. Given the following:

- Unit 1 is at 100% power.
- BB3, CTMT AIR TEMP HI, is in alarm.
- Containment average air temperature is 121°F and stable.

Which one of the following completes the statements below?

Dome recirculation fans _(1)_ required to be running in FAST.

MOV-3024A (B, C, D), EMER SW FROM 2A(2B, 2C, 2D) CTMT CLR VALVES, _(2)_ be opened to lower Containment temperature.

	(1)	(2)
A.	are NOT	CANNOT
B.	are NOT	CAN
C.	ARE	CANNOT
D.	ARE	CAN

28. Given the following:

At 1000:

- Unit 1 is in Mode 3.
- FCV-113A, BORIC ACID TO BLENDER, is mechanically bound and will **not** open.

At 1015:

- It is determined that an emergency boration is required due to a loss of Shutdown Margin.
- MOV-8104, EMERGENCY BORATE TO CHG PUMP SUCT, will **not** open.

Which one of the following completes the statements below per AOP-27.0, Emergency Boration, based on current plant conditions?

Based on the conditions at **1000**, the normal (non-emergency) boration flowpath _(1)_ available to the operating crew.

Based on the conditions at **1015**, the operating crew is required to emergency borate via the _(2)_.

A. (1) was NOT

(2) manual emergency boration flow path

B. (1) was NOT

(2) RWST

C. (1) WAS

(2) manual emergency boration flow path

D. (1) WAS

(2) RWST

29. Given the following,

- Unit 2 is performing AOP-12, Residual Heat Removal System Malfunction.
- The operating crew is at the step to "Verify secondary heat sink established"

Which one of the following completes the statements below per AOP-12?

The operating crew is required to maintain SG water level greater than a **minimum** of ____.

A. 82% WIDE range

B. 75% WIDE range

C. 50% NARROW range

D. 33% NARROW range

30. Given the following:

- Unit 1 is operating at 100% power.
- The 'A' Train is on service.

At 1000:

- AA4, CCW SRG TK LVL A TRN HI-LO, alarms.
- AB4, CCW SRG TK LVL B TRN HI-LO, alarms.
- The operating crew begins making up to the Surge Tank via the normal means.

At 1005:

- AA5, CCW SRG TK LVL A TRN LO-LO, alarms.
- The operating crew is continuing to add water to the Surge Tank.
- The Shift Supervisor has entered AOP-9.0, Loss of Component Cooling Water.

At 1007:

- LI-3027A, CCW SRG TK LVL, is 9 inches and lowering.

Which one of the following completes the statements below?

Based on the conditions at **1000**, the source of makeup water is _(1)_.

Based on the conditions at **1007**, a manual Reactor trip _(2)_ required.

	(1)	(2)
A.	Demin Water	IS
B.	Demin Water	is NOT
C.	Reactor Makeup Water	IS
D.	Reactor Makeup Water	is NOT

31. Which one of the following completes the statement below?

The power supply for MOV-8820B, 1B CS PUMP TO SPRAY HDR ISO, is ___.

A. 600V MCC 1U

B. 600V MCC 1V

C. 600V LC 1A

D. 600V LC 1B

32. Given the following:

- Unit 1 is operating at 100% power.

Subsequently,

- PT-444, PRZR PRESS, transmitter has failed "as is" at 2240 psig.
- The following is observed:
  - PT-445, PRZR PRESS, is 2220 psig and is lowering.
  - PT-455, PRZR PRESS, is 2222 psig and is lowering.
  - PT-456, PRZR PRESS, is 2218 psig and is lowering.
  - PT-457, PRZR PRESS, is 2221 psig and is lowering.

Which one of the following completes the statements below?

With no operator action, PK-444A, PRZR PRESS REFERENCE, controller will cause _(1)_ to lift to lower Pressurizer pressure.

Per AOP-100, Instrumentation Malfunction, taking **manual** control of PK-444A controller and _(2)_ demand will return pressure to the normal operating range.

Nomenclature: PCV-444B, PRZR PRESS
PCV-445A, PRZR PRESS

A. (1) PCV-444B ONLY

(2) RAISING

B. (1) PCV-444B and PCV-445A

(2) RAISING

C. (1) PCV-444B ONLY

(2) LOWERING

D. (1) PCV-444B and PCV-445A

(2) LOWERING

33. Which one of the following completes the statement below?

During the post LOCA **recirculation phase**, to maximize absorption of Iodine from the Containment atmosphere, the Containment Spray System sprays water with __(1)__ added at a pH of approximately __(2)__.

	(1)	(2)
A.	Trisodium Phosphate	4.5
B.	Lithium Hydroxide	7.5
C.	Trisodium Phosphate	7.5
D.	Lithium Hydroxide	9.0

34. Given the following:

- Unit 2 was operating at 100% power with the following conditions:
  - Containment temperature is 90°F.
  - Containment pressure is 0.0 psig.

Subsequently,

- A small LOCA occurs.
- Containment pressure rose to 10 psig and lowered at an approximately constant rate.
- The following conditions are now observed:
  - Hydrogen concentration in the Containment atmosphere is 2 volume percent.
  - Containment temperature is 120°F.
  - Containment pressure is 4.2 psig.

Which one of the following completes the statements below?

Per EEP-1, Loss of Reactor or Secondary Coolant, the post LOCA Hydrogen recombiners can be placed in service when Containment Hydrogen concentration is less than a **maximum** of _(1)_.

Based on the given conditions, the initial power level of the electric H_2 recombiners will be set to _(2)_.

Reference Provided

	(1)	(2)
A.	3.5%	55 KW
B.	3.5%	65 KW
C.	4.0%	55 KW
D.	4.0%	65 KW

35. Given the following:

At 1000:

- Unit 1 is performing FRP-S.1, Response to Nuclear Generation / ATWT.
- Control rods are stepping in at 60 steps per minute in **automatic**.

At 1005:

- The Reactor was tripped locally.
- Eight rods failed to fully insert.
- The operating crew calculates that 20,000 gallons of Boric Acid is to be added via emergency boration.

Which one of the following completes the statements below?

Based on the conditions at **1000**, the operating crew is required to _(1)_ and continue to insert rods until the Reactor is tripped.

Based on the conditions at **1005**, the operating crew _(2)_ **required** to add **all** 20,000 gallons of Boric Acid.

A. (1) immediately place control rods in **manual**

(2) IS

B. (1) leave control rods in **automatic** until rod speed is 48 steps per minute then place rods in manual

(2) IS

C. (1) immediately place control rods in **manual**

(2) is NOT

D. (1) leave control rods in **automatic** until rod speed is 48 steps per minute then place rods in manual

(2) is NOT

36. Given the following:

- Unit 1 is in a refueling outage.
- The refueling team is removing a fuel assembly from the core.
- The manipulator crane operator receives a red OVERLOAD light.

Subsequently,

- It was determined that the OVERLOAD interlock actuated when load was 1900 lbs.

Which of the following completes the statements below?

The OVERLOAD interlock operated _(1)_ the TR 13.9.3, Manipulator Crane, **maximum** allowed weight.

The OVERLOAD interlock _(2)_ be bypassed if the hoist needs to be moved before the overload is cleared.

	(1)	(2)
A.	LESS than	CAN
B.	GREATER than	CAN
C.	LESS than	CANNOT
D.	GREATER than	CANNOT

37. Given the following:

- Unit 1 experienced a spurious Reactor trip.
- The suctions of the AFW pumps were shifted to the Service Water System.
- The operating crew has just exited ESP-0.1, Reactor Trip Response, and is preparing to cooldown the RCS.

Which one of the following completes the statements below?

The operating crew was required to shift AFW pump suctions to the Service Water System when CST level was less than a **minimum** of (1).

If Service Water was used as a long-term (several days) source of feedwater flow to the Steam Generators, aside from the corrosion concerns, the **heat transfer capability** of the Steam Generators would be (2).

	(1)	(2)
A.	4.5 ft	UNAFFECTED
B.	5.3 ft	UNAFFECTED
C.	4.5 ft	AFFECTED
D.	5.3 ft	AFFECTED

38. Given the following:

- The Unit 1 Reactor has been tripped due to loss of Instrument Air.
- The operating crew is performing the actions of ESP-0.1, Reactor Trip Response.

Subsequently,

- SG Atmospheric Relief Valves (ARVs) are aligned per SOP-62.0, Emergency Air System.
- The operator applies 30 psig to the valve actuator for PCV-3371A, 1A MS ATMOS REL VLV.

Which one of the following completes the statements below?

When the loss of instrument air occurred, the MSIVs __(1)__.

At 30 psig of applied air pressure, PCV-3371A is __(2)__.

A. 1) immediately closed

   2) still closed

B. 1) remained open for a period of time

   2) still closed

C. 1) immediately closed

   2) partially open

D. 1) remained open for a period of time

   2) partially open

39. Given the following:

At 1000:

- Unit 2 is performing ECP-2.1, Uncontrolled Depressurization of ALL Steam Generators.

At 1001:

- The MSIVs cannot be closed from the Main Control Room.
- Closing the MSIV Instrument Air Root Valves failed to cause the MSIVs to close.

Which one of the following completes the statements below per ECP-2.1?

A note in ECP-2.1 _(1)_ state than local MSIV isolations should be performed on one loop at a time.

Based on the conditions at **1001**, the MSIVs are locally closed by _(2)_.

A. (1) DOES

(2) isolating and venting air

B. (1) DOES

(2) deenergizing the actuator solenoids at the associated DC panels

C. (1) does NOT

(2) isolating and venting air

D. (1) does NOT

(2) deenergizing the actuator solenoids at the associated DC panels

40. Given the following:

- Unit 1 has entered AOP-14.0, Secondary System Leakage.
- Control rods are in manual.
- Reactor power indication by NIs is 26% and stable.
- Main Turbine load is at 110 MW and stable.
- HF3, TAVG/TREF DEV, is in alarm.
- Pressurizer pressure is 2223 psig and stable.
- Pressurizer level is 22% and stable.
- SG NR levels are approximately 64% and stable.
- Containment pressure is 0.2 psig and stable.
- All Steam Dumps Indicate CLOSED with zero demand.

Based on the given conditions, which one of the following describes the **next** required actions/major mitigation strategy?

Nomenclature: EEP-0, Reactor Trip or Safety Injection
AOP-17.1, Emergent Turbine Power Reduction
UOP-2.1, Shutdown of Unit From Minimum Load to Hot Standby

A. Trip the Reactor, when the Reactor is verified tripped close the MSIV and Bypass valves, then go to EEP-0. Initiation of Safety Injection is not required before EEP-0 entry.

B. Trip the Reactor, when the Reactor is verified tripped both initiate Safety Injection and close the MSIV and Bypass valves, then go to EEP-0.

C. Commence a power reduction per AOP-17.1 and UOP-2.1, then at ~5% power perform a normal transfer to AFW, then close the MSIV and Bypass valves..

D. Commence a power reduction per AOP-17.1 and UOP-2.1, then at ~10% power maximize total AFW flow per AOP-14.0, then close the MSIV and Bypass valves.

41. Given the following:

- FRP-P.1, Response to Imminent Pressurized Thermal Shock, is in progress on Unit 2.
- All RCPs are stopped.
- An RCS soak is complete.

Which one of the following completes the statement below?

Any subsequent cooldown is limited to a **maximum** of _(1)_ and is required to be at this rate to prevent challenging the integrity of the _(2)_.

A. (1) less than 50°F in any 60 minute period

(2) Reactor vessel and its components such as hot and cold leg nozzles

B. (1) less than 15°F in any 60 minute period

(2) Reactor vessel and its components such as hot and cold leg nozzles

C. (1) less than 50°F in any 60 minute period

(2) Reactor Head and its components such as CRDM motor assemblies and other head penetrations

D. (1) less than 15°F in any 60 minute period

(2) Reactor Head and its components such as CRDM motor assemblies and other head penetrations

42. Given the following:

- Unit 2 is operating at 33% power.

Subsequently,

- A Hydrogen Temperature Controller malfunction occurs.

Which one of the following completes the statements below per AOP-100, Instrumentation Malfunction?

Based on the given conditions, if HYDROGEN TEMP, TI-4067 **cannot** be controlled to maintain below a **maximum** setpoint of _(1)_
the operating crew is required to **immediately** trip the _(2)_.

	(1)	(2)
A.	51°C	Reactor
B.	56°C	Reactor
C.	51°C	Main Turbine
D.	56°C	Main Turbine

43. Given the following:

- FRP-H.1, Response to Loss of Secondary Heat Sink, is in progress.
- A recovery using Condensate pumps is in progress.
- V509, SGFP BYP, would not open.

Which one of the following completes the statement below?

_(1)_ to allow flow to the SGs and is _(2)_.

A. (1) V503A, SGFP DISCH is required to be opened

(2) opened by opening the valve at the MCB then opening its associated breaker in the Turbine building

B. (1) V503A, SGFP DISCH is required to be opened

(2) opened by opening its associated breaker in the Turbine building then opening the valve manually

C. (1) V909A, SFGP 1A RECIRC FCV, is required to be left open

(2) verified open by placing the handswitch in the OPEN position

D. (1) V909A, SFGP 1A RECIRC FCV, is required to be left open

(2) verified open by using the manual operator

44. Given the following:

- ECP-0.0, Loss of All AC Power, is in progress.
- A Safety Injection signal is received.
- The operating crew is preparing to start the 1B DG.

Which one of the following completes the statements below?

The 1B DG is required to be started from the EPB in __(1)__.

When the 1B DG output breaker closes, ESF loads __(2)__.

A. (1) Mode 2

(2) automatically start

B. (1) Mode 2

(2) have to be manually aligned

C. (1) Mode 1

(2) automatically start

D. (1) Mode 1

(2) have to be manually aligned

45. Given the following:

- A complete loss of Offsite power has occurred on Unit 1.

Subsequently,

- The operating crew is performing the actions of FRP-H.1, Response to Loss of Secondary Heat Sink.
- KB1 and KB3, 1A and 1B SGFP MISC ALARM, are in alarm.
- The following indications are observed:
  - PI4001A, SGFP BRG OIL PRESS, is 10 psig and rising.
  - PI4001B, SGFP BRG OIL PRESS, is 10 psig and rising.

Which one of the following completes the statements below?

The SGFP Emergency Oil pumps _(1)_ running.

Per FRP-H.1, the plant conditions to utilize a SGFP to restore feed flow to the SGs _(2)_ met.

	(1)	(2)
A.	ARE	ARE
B.	ARE	are NOT
C.	are NOT	ARE
D.	are NOT	are NOT

46. Which one of the following completes the statement below?

The power supply to the 1C Condensate pump is ___.

A. 4160V bus 1C

B. 4160V bus 1D

C. 4160V bus 1E

D. 4160V bus 1J

47. Given the following:

- Unit 1 is at 8% power.

Subsequently.

- The Battery Input Breaker on the 1B inverter trips.
- WD2, 1B INV FAULT, annunciator alarms.
- No other Annunciators are in Alarm due to the fault.
- The Rover reports:
  - INVERTER POWERING LOAD lamp NOT lit.
  - BYPASS SOURCE AVAILABLE lamp is LIT.

Which one of the following completes the statements below?

The 1B 120V Vital AC panel is _(1)_.

The 1B INVERTER AMPERES meter on the EPB indicates _(2)_.

A. (1) Energized

(2) 0 Amps

B. (1) Energized

(2) Full Load Amps

C. (1) De-energized

(2) 0 Amps. When the MANUAL BYPASS SWITCH is taken to BYPASS SOURCE TO LOAD position it will indicate Full Load Amps

D. (1) De-energized

(2) 0 Amps. When the MANUAL BYPASS SWITCH is taken to BYPASS SOURCE TO LOAD position it will continue to indicate 0 Amps

48. Given the following:

- Unit 1 is at 45% power with the following conditions:
  - 1A SGFP is the only SGFP running.
  - FT-477 is selected on FS/478Y, A SG FW FLOW SEL SW.

Subsequently,

- FT-477, 1A SG FW FLOW, fails **low**.

Which one of the following completes the statements below with no operator actions?

Controller demand on FK-478, 1A SG FW FLOW, will **initially** (1) .

Controller demand on SK-509A, SGFP MASTER CONT, will **initially** (2) .

	(1)	(2)
A.	RISE	LOWER
B.	RISE	RISE
C.	LOWER	LOWER
D.	LOWER	RISE

49. Given the following:

- Unit 1 is operating at 100%.

Subsequently,

- A SG Tube Leak occurs on 1A SG.
- R-19, SGBD SAMPLE, alarms.

Which one of the following completes the statements below?

__(1)__ valves will automatically close.

Per SOP-45.0, Radiation Monitoring System, the action associated with R-19 required to allow the Shift Chemist to obtain a sample of the SGs is to __(2)__.

A. (1) HV-3328, HV-3329 AND HV-3330, STEAM GEN 1A(1B,1C) SAMPLE ISO,

(2) remove the CONTROL power fuses for R-19

B. (1) HV-3328, HV-3329 AND HV-3330, STEAM GEN A(1B,1C) SAMPLE ISO,

(2) place R-19 Operations Selector Switch to the RESET position

C. (1) HV-3179A, 3180A, AND 3181A, STEAM GEN A(1B,1C) LOWER BLOWDOWN,

(2) remove the CONTROL power fuses for R-19

D. (1) HV-3179A, 3180A, AND 3181A, STEAM GEN 1A(1B,1C) LOWER BLOWDOWN,

(2) place R-19 Operations Selector Switch to the RESET position

50. Given the following:

- Unit 1 is operating at 100% power.

Subsequently,

- 1A and 1B MDAFW pumps receive an automatic start signal.

Which one of the following completes the statements below?

Steam Generator Blowdown _(1)_ isolated.

Steam Generator Blowdown Sampling System _(2)_ isolated.

	(1)	(2)
A.	IS	IS
B.	is NOT	IS
C.	IS	is NOT
D.	is NOT	is NOT

51. Which one of the following completes the statement below?

The power supply to the 2B MDAFW pump is ___.

A. 4160 Bus 2E

B. 4160 Bus 2G

C. 4160 Bus 2J

D. 4160 Bus 2L

52. Given the following:

- Unit 1 is operating at 100%.

Subsequently,

- 1A Start Up transformer becomes de-energized.
- A Safety Injection occurs.
- MOV-515, SW TO TURB BLDG ISO A TRN & MOV-517, SW TO TURB BLDG ISO B TRN indicate **throttled**.

Which one of the following completes the statements below?

Per Attachment 3 of EEP-0, Reactor Trip or Safety Injection, MOV-515 & MOV-517, _(1)_ required to be closed.

The purpose for MOV-515 & MOV-517 being in their required position is to _(2)_.

A. (1) ARE

(2) ensure adequate Service Water flow to safety related equipment during accident conditions

B. (1) ARE

(2) ensure a postulated break in Service Water piping will not result in the loss of cooling to non-safety related equipment

C. (1) are NOT

(2) ensure adequate Service Water flow to the Hydrogen Seal Oil Coolers

D. (1) are NOT

(2) ensure adequate Service Water flow to lube oil coolers in the Turbine Building

53. Given the following:

- Motor Driven Fire Pump was started manually for Fire Protection System testing.

Which one of the following completes the statements below?

The Motor Driven Fire Pump is powered from 4160V bus __(1)__.

With no operator actions, the Motor Driven Fire Pump __(2)__ be running 5 minutes after a complete loss of Offsite power.

	(1)	(2)
A.	1L	WILL
B.	1J	WILL
C.	1L	will NOT
D.	1J	will NOT

54. Given the following:

- Unit 2 is in MODE 3.

Subsequently,

- The 2B Aux Building Battery Charger DC output breaker is inadvertently opened by an operator.

Which one of the following completes the statements below?

__(1)__ will **immediately** alarm when the above breaker is opened.

__(2)__ is applicable in the current mode.

Nomenclature: YC2, 2B 125V DC BUS UV OR GND
YC4, 2B BATT CHG FAULT OR DISC

A. (1) YC4 ONLY

(2) LCO 3.8.4 DC Sources — Operating

B. (1) YC2 **and** YC4

(2) LCO 3.8.4 DC Sources — Operating

C. (1) YC4 ONLY

(2) LCO 3.8.5 DC Sources—Shutdown

D. (1) YC2 **and** YC4

(2) LCO 3.8.5 DC Sources—Shutdown

55. Given the following:

- A Loss of All AC has occurred on Unit 1.

Subsequently,

- LB-18, 1B 125V DC BUS BATT BKR, tripped open.

Which one of the following completes the statements below?

The 2C DG __(1)__ be started from the EPB.

DJ06-1, UNIT 1 2C DG OUTPUT BKR, __(2)__ capable of being closed from the EPB.

	(1)	(2)
A.	CAN	IS still
B.	CAN	is NOT
C.	CANNOT	IS still
D.	CANNOT	is NOT

56. Given the following:

- AOP-28.0, Control Room Inaccessibility, is in progress on Unit 2.

Which one of the following completes the statements below?

The MDAFWP FCVs will be operated in LOCAL at the _(1)_.

Per a NOTE in AOP-28.0, Operator action is required to control the MDAFWP FCVs in LOCAL at the HSDP in order to prevent _(2)_.

A. (1) F HSDP

(2) low SG water level due to valve position

B. (1) F HSDP

(2) isolating letdown due to cooldown

C. (1) A HSDP

(2) low SG water level due to valve position

D. (1) A HSDP

(2) isolating letdown due to cooldown

57. Given the following:

Unit 2 is operating at 100% power.

Subsequently,

- R-23A, SGBD HX OUTLET, fails high.

Which one of the following completes the statement below?

___ will automatically close.

A. HV-7614A(B, C), 2A(2B, 2C) SGBD ISO,

B. FCV-1152, S/G BLDN HX OUTLET FCV,

C. RCV-023B, SGBD DISCH TO ENVIRONMENT,

D. HV-7697A(B), 7698A(B) and 7699A(B), 2A(2B, 2C) SGBD PENE RM ISO,

58. Given the following:

- Unit 1 Containment Cooling Fans are in operation per SOP-12.1, Containment Air Cooling System.

Subsequently:

- R-20A, SW RTN - CTMT CLR, is in HI ALARM.

Which one of the following completes the statements below?

MOV-3441A, SW FROM 1A CTMT CLR, __(1)__ automatically close.

R-20A monitors SW discharge from the __(2)__ Containment Cooler(s).

	(1)	(2)
A.	did NOT	1A **and** 1B
B.	DID	1A **and** 1B
C.	did NOT	1A **only**
D.	DID	1A **only**

59. Given the following:

- Unit 1 is operating at 100%.
- 'A' train is on service.
- 1A, 1B, 1D, and 1E Service Water (SW) pumps are running.
- The UNIT ONE 'A' TRAIN SPARE SW PUMP SELECTOR SWITCH has just been placed in the 1A position.

At 1000:

- A complete loss of offsite power occurs.

At 1010:

- A spurious Safety Injection occurs.

Which one of the following completes the statements below with no operator actions?

Based on the conditions at **1001**, the _(1)_ SW pumps are running.

Based on the conditions at **1011**, **all five** SW pumps _(2)_ running.

	(1)	(2)
A.	1A, 1B, 1D, 1E	ARE
B.	1B, 1C, 1D, 1E	ARE
C.	1A, 1B, 1D, 1E	are NOT
D.	1B, 1C, 1D, 1E	are NOT

60. Given the following:

- Unit 1 was operating at 100% power.

Subsequently,

- WE2, 1F, 4KV BUS OV-OR-UV OR LOSS OF DC, is in alarm.
- AOP-5.2, Degraded Grid, has just been entered.
- Voltage on all emergency busses for both units are reading 3825 volts.
- MVARS are reading (+) 515 on the MCB.
- The Shift Supervisor has directed the Unit Operator to maintain (+) 250 MVARS.

Which one of the following will complete the statements below?

The Operator is required to __(1)__ voltage.

After the operator adjusts voltage, current to large motors, such as the RCP or CW pump motors, will __(2)__.

	(1)	(2)
A.	RAISE	LOWER
B.	RAISE	RISE
C.	LOWER	LOWER
D.	LOWER	RISE

61. Given the following:

- The Service Air Compressors (SAC) are operating on their individual internal pressure switches.
- The 1A SAC is aligned as the LEAD compressor.

Which one of the following completes the statement below?

the 1A SAC will LOAD when Instrument Air pressure falls to a **maximum** setpoint of ____.

A. 88 psig

B. 90 psig

C. 92 psig

D. 100 psig

62. Given the following:

- A large fire occurs in the Service Water Intake Structure on the Unit 1 pump deck.

Which one of the following completes the statements below?

MH4, Fire _(1)_ alarm.

The Siemens Firefinder XLS Network Command Center in the Main Control Room _(2)_ alarm.

	(1)	(2)
A.	WILL	WILL
B.	WILL	will NOT
C.	will NOT	WILL
D.	will NOT	will NOT

63. Given the following:

- Unit 1 is operating at 100% power.

At 1000:

- Containment Pressure is 0 psig.
- Containment temperature is 100°F.
- MI-3319A, B, C and D, CTMT CLR SUPP AIR MOISTURE, indicate 72 Dewpoint °F.
- Containment Coolers are running in slow speed.

At 1015:

- A LOCA occurs and the following conditions exist:
  - Containment Pressure is 5 psig.
  - Containment temperature is 195°F.
  - MI-3319A, B, C and D, CTMT CLR SUPP AIR MOISTURE, indicate 130 Dewpoint °F.

Which one of the following completes the statements below at **1030**?

The Containment Cooler discharge will be through the _(1)_.

The Containment Cooler fans will be drawing _(2)_ amps than at 1000.

	(1)	(2)
A.	ductwork	MORE
B.	dropout plate	MORE
C.	ductwork	LESS
D.	dropout plate	LESS

64. Given the following:

At 1000:

- Unit 1 is operating at 100% power.
- Containment pressure is (+) 2.1 psig.

Which one of the following completes the statements below?

A Required Action Statement of LCO 3.6.4 Containment Pressure _(1)_ required to be entered.

Placing Containment Mini-purge in operation _(2)_ be used to lower pressure.

	(1)	(2)
A.	IS	CANNOT
B.	IS	CAN
C.	is NOT	CANNOT
D.	is NOT	CAN

65. Given the following:

- Unit 1 is recovering from a loss of instrument air.

Which one of the following completes the statements below per AOP-6, Loss of Instrument Air?

Of the values listed below, to re-open V904, NON-ESSENTIAL IA HDR AUTO ISO, air header pressure must above a **minimum** of _(1)_.

In addition to meeting the above air pressure requirement, to **re-open** V904, NON-ESSENTIAL IA HDR AUTO ISO, the operator is required to _(2)_.

A. (1) 50 psig

(2) depress the reset button for V904 on AIR COMP SOL VALVE LOCAL CONT STATION, N1H23S572-N

B. (1) 50 psig

(2) depress the reset button for V904 on AIR COMP SOL VALVE LOCAL CONT STATION, N1H23S572-N then open V904 on the BOP

C. (1) 60 psig

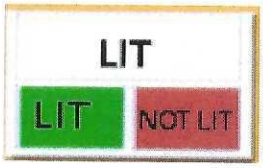
(2) depress the reset button for V904 on AIR COMP SOL VALVE LOCAL CONT STATION, N1H23S572-N

D. (1) 60 psig

(2) depress the reset button for V904 on AIR COMP SOL VALVE LOCAL CONT STATION, N1H23S572-N then open V904 on the BOP

66. Given the following:

- A plant heatup and pressurization are in progress on Unit 1.
- All RCPs are running.
- RCS pressure is 925 psig and stable.
- RCS temperature is 375°F.
- Accumulators are filled and pressurized.
- An operator observes the following on:
  - MOV-8808A, 1A ACCUM DISCH ISO, handswitch is in the AUTO position.
  - MOV-8808A handswitch lights are as seen below:



Which one of the following completes the statement below?

MOV-8808A's condition __(1)__ acceptable for plant conditions.

MOV-8808A __(2)__ receive an automatic OPEN signal if RCS pressure exceeds a setpoint of 2000 psig.

Reference Provided

	(1)	(2)
A.	is NOT	will NOT
B.	IS	will NOT
C.	is NOT	WILL
D.	IS	WILL

67. Given the following:

- Unit 1 is performing STP-11.6, Residual Heat Removal Valves Inservice Test.
- MOV-8889, RHR TO RCS HOT LEGS ISO, is going to be tested.

Which one of the following completes the statements below?

MOV-8889 _(1)_ allowed to be stroked open and then back closed one time **prior** to time stroking per STP-11.6.

The stroke time of MOV-8889 is measured using the _(2)_ indication.

	(1)	(2)
A.	IS	Main Control Board
B.	is NOT	Main Control Board
C.	IS	local
D.	is NOT	local

68. Given the following plant conditions:

- Unit 1 is in **MODE 2**.
- RCS pressure has exceeded the limit of SL 2.1.2 - RCS Pressure Safety Limit.

Based on the given conditions, which one of the following describes the correct actions and completion times in accordance with Technical Specifications?

A. Restore compliance and be in MODE 3 within 1 hour.

B. Restore compliance within 1 hour, the Unit may remain in MODE 2.

C. Restore compliance within 5 minutes, the Unit may remain in MODE 2.

D. Restore compliance within 1 hour and be in MODE 3 within the following hour.

69. Given the following:

- A liquid waste release is in progress on Unit 1.

Subsequently:

- R-18, LIQ WASTE DISCH, loses instrument power.
- Maintenance reports that the R-18 power supply will not be repaired this shift.

Which one of the following completes the statements below?

The liquid waste release __(1)__ automatically stopped.

Based on the conditions in the stem, the ODCM __(2)__ allow a liquid waste release to be performed while R-18 is out of service when the appropriate compensatory action(s) has(have) been performed.

	(1)	(2)
A.	WAS	does NOT
B.	was NOT	does NOT
C.	WAS	DOES
D.	was NOT	DOES

70. Given the following:

- Unit 1 has had a Reactor trip and Safety Injection actuation with the following conditions:
  - A LOCA has occurred in containment.
  - RCS pressure is 1100 psig and slowly lowering.
  - Containment pressure is 12 psig and slowly rising.
  - Instrument Air pressure is 80 psig.

Which one of the following is the annunciator that is in alarm **at this time** with no operator action?

A. MCB alarm JH1, 1A SG MSIV CLOSED

B. MCB alarm CD1, 1A ACCUM PRESS HI-LO

C. MCB alarm HD2, PRZR PRESS SI PORV BLOCK P-11

D. BOP alarm LB3, RCP THRM BARR ISO HV-3184 AIR PRESS LO

71. Given the following:

- ESP-1.1, SI Termination is in progress on Unit 2.
- The operating crew is at the step to "[CA] Maintain pressurizer level 25%-50% {50%-60%}".

Which one of the following completes the statement below?

As specified in NMP-AP-005-001, Farley Transient Response Instruction, the term "Maintain" in this ESP-1.1. step means to ___.

A. begin and maintain a prescribed course of action

B. change a specified feature so a specified parameter meets specified value

C. operate appropriate components to control a specific parameter to a procedure requirement

D. observe an expected condition exists AND take action to establish the condition if it does not exist

72. Given the following:

- ECP-1.2, LOCA Outside Containment, is in progress.

Which one of the following completes the statements below?

__(1)__ is the **initial** required action.

The operating crew is required to use __(2)__ to verify the leak is isolated.

A. (1) Verifying the RHR loop suction valves closed

(2) RVLIS

B. (1) Verifying the RHR loop suction valves closed

(2) RCS pressure

C. (1) Isolating RHR cold leg injection

(2) RVLIS

D. (1) Isolating RHR cold leg injection

(2) RCS pressure

73. Given the following:

- FRP-P.1, Response to Imminent Pressurized Thermal Shock Condition, is in progress on Unit 1.
- Step 18 "Reduce RCS pressure" has been completed.
- Step 19 "[CA] Check pressurizer level - ..." is being evaluated.
  - Pressurizer level is 40% and stable.
  - Containment pressure is 17 psig and slowly lowering.

Which one of the following completes the statements below per FRP-P.1?

Pressurizer level _(1)_ required to be raised.

If Pressurizer level is raised using Charging, the operating crew _(2)_ required to maintain RCS pressure **stable** until completion of any required soak.

	(1)	(2)
A.	is NOT	is NOT
B.	is NOT	IS
C.	IS	is NOT
D.	IS	IS

74. Given the following:

- Unit 2 has experienced a LOCA.
- Containment pressure is 12 psig and lowering.
- ECP-1.1, Loss of Emergency Coolant Recirculation, is in progress.
- The operating crew is at step 15 "Begin RCS cooldown to cold shutdown".

Which one of the following completes the statements below?

Once the proper SG levels are established, the operating crew is required to maintain the intact SG Narrow Range levels above a **minimum** of _(1)_.

The **maximum** allowed cooldown rate is _(2)_.

A. (1) 31%

(2) less than 100°F in any 60 min period

B. (1) 48%

(2) less than 100°F in any 60 min period

C. (1) 31%

(2) maximum attainable rate from intact SGs until intact SG pressure is less than 680 psig

D. (1) 48%

(2) maximum attainable rate from intact SGs until intact SG pressure is less than 680 psig

75. Given the following:

- Unit 1 has experienced a LOCA.

Subsequently,

- ECCS is aligned for Cold Leg Recirculation.
- Containment pressure is 30 psig and is slowly lowering.
- LI-3594A, CTMT SUMP LVL, indicates 8.0 feet.

Which one of the following completes the statements below?

FRP-Z.2, Containment Flooding, entry requirements _(1)_ met.

Based on the given conditions, CCW _(2)_ a potential source of excess water in the Containment sump.

	(1)	(2)
A.	are NOT	IS
B.	are NOT	is NOT
C.	ARE	IS
D.	ARE	is NOT

76. Given the following:

- FE5, 1A or 1B ROD CONT MG SET TRIPPED, is alarming intermittently due to a ground condition.
- The 1A and 1B Rod Drive MG sets are running normally.
- The system engineer recommends disabling the alarm to prevent nuisance alarms for the operators.

Which one of the following completes the statements below?

Per NMP-ES-095-002, Temporary Configuration Change Process, a Temporary Configuration Change (TCC) __(1)__ required for disabling FE5.

The **lowest** level of authority required to approve disabling FE5 is the __(2)__ .

	(1)	(2)
A.	is NOT	Shit Manager
B.	is NOT	Shift Supervisor
C.	IS	Shift Manager
D.	IS	Shift Supervisor

77. Given the following:

- An inadvertent Reactor trip on Unit 2 occurred.
- ESP-0.1, Reactor Trip Response, is in progress.
- All RCPs are running.

Subsequently:

- While checking RCP seal support conditions, the operator observes the following:

  - RCS pressure is 2240 psig
  - Seal injection 8 gpm per pump
  - Seal leakoff 2A RCP 4.5 gpm
  - Seal leakoff 2B RCP 2.1 gpm
  - Seal leakoff 2C RCP 3.5 gpm
  - Seal DP > 400 psid/pump

Which one of the following completes the statements below?

All RCPs _(1)_ within the acceptable region of ESP-0.1, Figure 1.

If needed to be performed, AOP-4.0, Loss of Reactor Coolant Flow, can be entered by the Shift Supervisor _(2)_.

Reference Provided

A. (1) ARE

   (2) and be performed in parallel **without** being specifically directed by ESP-0.1

B. (1) are NOT

   (2) and be performed in parallel **without** being specifically directed by ESP-0.1

C. (1) ARE

   (2) ONLY if specifically directed to be performed by ESP-0.1

D. (1) are NOT

   (2) ONLY if specifically directed to be performed by ESP-0.1

78. Given the following:

- Unit 1 is at 17% power performing a startup when the following occurs:

At 0800:

- LI-459, PRZR LVL, fails **low**.

At 1000:

- LI-460, PRZR LVL, begins to slowly oscillate +/- 25% around the LI-461 level reading due a degrading power supply module.
- LI-461, PRZR LVL, is stable at the previous Pressurizer level.

Which one of the following completes the statements below?

Plant conditions at **0800** (1) meet applicability conditions to enter a REQUIRED ACTION per LCO 3.3.1, Reactor Trip System (RTS) Instrumentation.

If plant conditions at **1000** do not change, LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation, (2) direct the crew to place the plant in MODE 3 after the required completion time expires.

Reference Provided

	(1)	(2)
A.	DO	DOES
B.	do NOT	does NOT
C.	DO	does NOT
D.	do NOT	DOES

79. Given the following:

- Unit 1 has experienced a large break LOCA

Subsequently:

At 1000:

- A complete **loss of Offsite power** occurs.
- Both RHR Pumps tripped after starting.
- ECP-1.1, Loss of Emergency Coolant Recirculation, is in progress at the step to "Evaluate containment spray requirements".

- The following is observed:
  - Both Containment Spray pumps are running.
  - Containment Pressure is 30 psig and slowly lowering.
  - RWST level is 8 ft and slowly lowering.
  - Containment Spray pump suctions are aligned to the RWST.

At 1015:

- The STA reports the Critical Safety Function Status Trees (CSFSTs) are:
  - Core Cooling - ORANGE
  - Integrity - RED (The operating crew has previously entered and exited FRP-P.1, Response to Imminent Pressurized Thermal Shock Conditions.)
  - Containment - YELLOW
  - Inventory - YELLOW
  - ALL other CSFSTs are GREEN

Which one of the following completes the statements below per ECP-1.1?

Based on the conditions at **1000**, the Shift Supervisor is required to stop _(1)_ Containment Spray Pump(s).

Based on conditions at **1015**, an immediate transition to C.2, Response to Degraded Core Cooling, _(2)_ required.

Reference Provided

	(1)	(2)
A.	BOTH	IS
B.	Only ONE	IS
C.	BOTH	is NOT
D.	Only ONE	is NOT

80. Given the following:

- Unit 1 has experienced a Small Break LOCA.
- The operating crew was performing ESP-1.2, Post LOCA Cooldown and Depressurization.
- The operating crew has **not** been able to establish any injection flow.

Subsequently:

- The operating crew has transitioned to FRP-C.2, Response to Degraded Core Cooling, and the following conditions exist:
  - SGs have just been depressurized to atmospheric pressure.

Which one of the following completes the statements below?

Per the applicable background document(s), Reactor Vessel downcomer voiding could seriously perturb source range NI indications causing a constant positive SUR _(1)_ .

Per FRP-C.2, when SI flow has been established and Core Cooling is restored, the operating crew is required to transition to _(2)_.

A. (1) which indicates an actual supercritical core condition

   (2) ESP-1.2, Post LOCA Cooldown and Depressurization

B. (1) **without** the core actually being supercritical

   (2) ESP-1.2, Post LOCA Cooldown and Depressurization

C. (1) which indicates an actual supercritical core condition

   (2) EEP-1, Loss of Reactor or Secondary Coolant

D. (1) **without** the core actually being supercritical

   (2) EEP-1, Loss of Reactor or Secondary Coolant

81. Given the following:

At 1000:

- Unit 2 is operating at 100% power.
- A Train is on service.
- 2A CCW pump is tripped.
- 2A Charging pump is in service.

At 1010:

- EA2, CHG HDR FLOW HI-LO, alarms.
- EA3, CHG PUMP LUBE OIL TEMP HI, alarms.
- The Radside systems operator reports the 2A Charging pump local temperature is 185°F and rapidly rising.

Which one of the following completes the statements below at **1010**?

The operating crew is required to _(1)_.

Per the BASES of LCO 3.5.2, ECCS-Operating, 100% of flow equivalent to a single ECCS train _(2)_ available.

A. (1) immediately stop the 2A Charging pump

(2) is NOT

B. (1) immediately stop the 2A Charging pump

(2) IS

C. (1) take manual control of FK-122, CHG FLOW, and raise demand, start 2B Charging pump, then stop 2A Charging pump

(2) is NOT

D. (1) take manual control of FK-122, CHG FLOW, and raise demand, start 2B Charging pump, then stop 2A Charging pump

(2) IS

82. Given the following:

- Unit 1 is operating at 100% power.
- CTMT CLR FANS SEL switches are positioned as follows:
  - A Train selected to 1A
  - B Train selected to 1D

Subsequently,

While performing STP-17.0, Containment Cooling System Train A(B) Operability Test, the following deficiencies were discovered or occurred:

- 1A and 1B CTMT CLRs were determined to be clogged with maximum attainable SW flow being 500 gpm.
- BA3, 1C CTMT CLR FAN FAULT, came into alarm due to EE-08, 1C CTMT CLR FAN SLOW SPEED, tripping open when started.

Which one of the following completes the statements below?

The REQUIRED ACTION of LCO 3.6.6, Containment Spray and Cooling Systems for _(1)_ is required to be entered.

Per the BASES of LCO 3.6.6, the Containment Spray System and Containment Cooling System limit the temperature and pressure that could be experienced following a design basis _(2)_.

Nomenclature: MSLB - Main Steam Line Break

Reference Provided

	(1)	(2)
A.	Condition C	LOCA ONLY
B.	Condition D	LOCA ONLY
C.	Condition C	LOCA or MSLB
D.	Condition D	LOCA or MSLB

83. Given the following:

- Unit 1 is operating at 100% Power.
- R-70B, 1B SG TUBE LEAK DET, indicates 200 GPD.

At 1000:

- A Main Steam Line Break from the 1B SG occurs in CTMT with the following conditions:
  - 1 Containment Spray Pump is running with ~ 2800 GPM of flow.
  - RE-27A and RE-27B read 1R/HR.
  - No CTMT Cooler Fans are running.
  - CTMT Sump Level is 2 feet.
  - CTMT pressure peaked at 30 psig.
  - CTMT H2 Analyzers read 0.01% and steady.
  - All Critical Safety Function Status Trees (CSFST), except CONTAINMENT, are either YELLOW or GREEN.

Which one of the following completes the statements below based on the conditions at **1000**?

Entry into FRP-Z.1, Response to High Containment Pressure, _(1)_ **required**.

Per NMP-EP-141-001-F01, Farley - Hot Initiating Condition Matrix, A POTENTIAL LOSS of Containment _(2)_ exist.

Do not base your decision on Emergency Director Judgment

Reference Provided

	(1)	(2)
A.	is NOT	does NOT
B.	is NOT	DOES
C.	IS	does NOT
D.	IS	DOES

84. Given the following:

- Unit 2 is at 85% power and ramping down for a forced outage.
- During the ramp, FB2, NI-35 Loss of Compensating Voltage, alarmed.
- The crew has entered AOP-100, Instrumentation Malfunction.

Which one of the following completes the statements below?

Per AOP-100, Shift Manager approval __(1)__ required prior to placing the affected channel in LEVEL TRIP BYPASS,

If the affected channel is **not** placed in BYPASS and the shutdown continued, the **earliest** time a reactor trip will occur is when the __(2)__ interlock setpoint is reached.

Nomenclature: P-6: I/R Power Escalation Permissive
P-10: PR Power Escalation Permissive

	(1)	(2)
A.	IS	P-6
B.	IS	P-10
C.	is NOT	P-6
D.	is NOT	P-10

85. Given the following:

- Unit 1 is operating at 100% power.
- FG1, SG TUBE LEAK ABOVE SETPT, has come into alarm due to R-70C being above setpoint.
- R-70C has risen and is currently reading 128 gpd.
- R-15 has risen since the initial alarm and continues to rise.

Subsequently,

- The plant is in Mode 3
- Plant management has decided the MSIVs will be closed during the cooldown.

Which one of the following actions would the operator take in accordance with FNP-1-AOP-2.0, Steam Generator Tube Leakage?

The most limiting operator action(s) required by the applicable Action Level is to __(1)__.

The Shift Supervisor is required to cooldown using __(2)__ .

Nomenclature: FNP-1-UOP-2.2, Shutdown from Hot Standby to Cold Shutdown.

A. (1) place the Unit in Mode 3 in 24 hours.

   (2) UOP-2.2

B. (1) reduce power to less than or equal to 50% rated thermal power within 1 hour and place the unit in Mode 3 within 3 hours.

   (2) UOP-2.2

C. (1) place the Unit in Mode 3 in 24 hours.

   (2) AOP-2

D. (1) reduce power to less than or equal to 50% rated thermal power within 1 hour and place the unit in Mode 3 within 3 hours.

   (2) AOP-2

86. Given the following:

- A Steam Generator Tube Rupture (SGTR) has occurred in 1A SG.
- Both MSIVs on the 1A Steam Line are stuck open.
- All RCPs are secured.
- One PORV is stuck open and isolated.
- One PORV is Operable.
- EEP-3, Steam Generator Tube Rupture, has been entered from EEP-0, Reactor Trip or Safety Injection.

Which one of the following is the next procedure entered after EEP-3 if the given plant conditions do not change?

A. ESP-3.1, Post SGTR Cooldown Using Backfill

B. ~~ECP-3.1, SGTR with Loss of Reactor Coolant Such Recovery Desired~~

C. ECP-3.2, SGTR with Loss of Reactor Coolant Saturated Recovery Desired

D. ECP-3.3, SGTR without Pressurizer Pressure Control

B. ECP-3.1, SGTR with Loss of Reactor Coolant Subcooled Recovery Desired

87. Given the following:

- Unit 1 is operating at 100% power.
- Rod Bank Selector Switch is in AUTO

At 1000:

- A fault on the 1D inverter resulted in the loss of the 1D 120V AC Vital Instrumentation Panel.

At 1005:

- Power was restored to the 1D vital panel by placing the Manual Bypass Switch to the "Bypass Source to Load position".

Which one of the following completes the statements below?

Based on the conditions at **1000**, the operating crew _(1)_ required to take Rod Control to Manual.

Based on the conditions at **1005**, LCO 3.8.9, Distribution Systems - Operating _(2)_ be exited.

	(1)	(2)
A.	is NOT	CAN
B.	is NOT	CANNOT
C.	IS	CAN
D.	IS	CANNOT

88. Given the following:

- A spurious Reactor trip and Safety Injection have occurred on Unit 1.
- FRP-H.1, Response to Loss of Secondary Heat Sink, is in progress
- The crew is attempting to restore SG level using a SGFP.

Subsequently,

- 1A SGFP is in service.
- Total feed flow is 400 gpm.
- All SG **Narrow** Range Levels are 0%.
- SG **Wide** Range levels are:
  - 1A SG: 60% and slowly rising.
  - 1B SG: 62% and slowly rising.
  - 1C SG: 59% and slowly rising.

Which one of the following completes the statements below?

Implementation of FRP-H.1, Attachment 1, Main Feedwater Bypass Valves Automatic Closure Defeat, __(1)__ **required** to open the Main Feedwater Bypass valves.

FRP-H.1 __(2)__ be exited based on current plant conditions.

	(1)	(2)
A.	IS	CANNOT
B.	is NOT	CANNOT
C.	IS	CAN
D.	is NOT	CAN

The Shift Supervisor is preparing to exit ECP-0.0, Loss of ALL AC Power, and is at step 32 "Select Recovery Procedure"

89. Given the following:

- A loss of all AC power has occurred on Unit 2.

At 1000:

- The 2B DG is started from the EPB and power has been restored to the 2G, 2L and 2J 4160V busses.

At 1005:

- ~~The Shift Supervisor is preparing to exit ECP-0.0, Loss of ALL AC Power, and is at the step to "Evaluate plant conditions".~~
- SCMM is 39°F.
- Pressurizer level is 16% and slowly falling.
- CTMT pressure is 5.8 psig.
- SI equipment did NOT automatically actuate when power was restored.

Which one of the following completes the statements below?

Based on the conditions at **1000**, the 2B DG output breaker _(1)_.

Based on the conditions at **1005**, the Shift Supervisor is required to transition to _(2)_.

Nomenclature: ECP-0.1, Loss of All AC Power Recovery Without SI Required.
ECP-0.2, Loss of All AC Power Recovery With SI Required.

A. (1) closed automatically

(2) ECP-0.1

B. (1) was manually closed

(2) ECP-0.1

C. (1) closed automatically

(2) ECP-0.2

D. (1) was manually closed

(2) ECP-0.2

N.B. Q89 DELETED FROM EXAM DUE TO POST-EXAM COMMENT RESOLUTION

90. Given the following:

- Unit 1 is in Mode 3.
- The crew entered AOP-6.0, Loss of Instrument Air.
- Instrument Air is 0 psig with ALL available Air Compressors running.

Which one of the following completes the statements below?

LCO 3.7.4, Atmospheric Relief Valves, _(1)_ applicable given the current plant conditions.

Per the BASES of LCO 3.7.4, the Atmospheric Relief Valves (ARVs) are considered _(2)_.

	(1)	(2)
A.	is NOT	INOPERABLE
B.	IS	INOPERABLE
C.	is NOT	OPERABLE
D.	IS	OPERABLE

91. Given the following:

On May 1, at 1000:

- Unit 1 was operating at 100% power.
- FG5, GFFD SYS TRBL, alarmed.
- AOP-32, High RCS Activity, is in progress.
- Chemistry reported the following:
  - Dose Equivalent I-131 (DEI) is 1 µCi/gm.
  - Gross Specific Activity is .55 µCi/gm.
  - E BAR=175
- Chemistry sample has determined that there is a fuel element leak.

On May 2, at 2200:

- The plant is in Mode 3 with RCS Tavg at 475F.
- Chemistry reports conditions unchanged as follows:
  - Dose Equivalent I-131 (DEI) is 1 µCi/gm.
  - Gross Specific Activity is .55 µCi/gm.
  - E BAR=175

Which one of the following completes the statements below?

On **May 2, at 2200**, RCS Tavg _(1)_ meets the requirement of LCO 3.4.16, RCS Specific Activity, BASES to limit the release of radioactivity in the event of a Steam Generator Tube Rupture(SGTR).

Per NMP-EP-141-001-F01, Farley - Hot Initiating Condition Matrix, SU3 _(2)_ applicable.

Reference Provided

	(1)	(2)
A.	does NOT	IS
B.	DOES	IS
C.	does NOT	is NOT
D.	DOES	is NOT

N.B. Q91 DELETED FROM EXAM DUE TO POST-EXAM COMMENT RESOLUTION.

92. Given the following:

- A large break LOCA has occurred on Unit 1.
- The operating crew is performing ESP-1.3, Transfer to Cold Leg Recirculation.
- The operating crew is at Step 2 "Check SI in service".
- The current plant parameters are reported:
  - The **hottest** Core Exit Thermocouples are:
    - 1203°F and rising.
    - 1202°F and rising.
    - 950°F and rising.
    - 920°F and rising.
    - 918°F and rising.
  - Containment pressure is 37 psig and lowering.
  - SCMM reads 720°F superheat.

Which one of the following completes the statements below based on the given conditions?

The Critical Safety Function Status Tree - CORE COOLING is _(1)_.

The Shift Supervisor _(2)_ required to immediately transition to the appropriate Functional Restoration Procedure.

	(1)	(2)
A.	ORANGE	IS
B.	ORANGE	is NOT
C.	RED	IS
D.	RED	is NOT

93. Which of the following completes the statements below per NMP-OS-007-003, Plant Operating Orders?

Standing Orders are approved by a(an) __(1)__.

The Standing Order __(2)__.

A. (1) Operations Manager or Shift Manager

(2) **is not** required to have a termination date

B. (1) Shift Supervisor or any actively licensed SRO

(2) **is not** required to have a termination date

C. (1) Operations Manager or Shift Manager

(2) will automatically terminate after 3 days

D. (1) Shift Supervisor or any actively licensed SRO

(2) will automatically terminate after 3 days

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

During the Control Rod Drive Shaft Latching and RCCA Drag Testing evolutions, per FHP-0.0, Refueling Organization, the Fuel Handling Supervisor _(1)_ with no other concurrent responsibility.

Per UOP-4.1, Controlling Procedure for Refueling,
two Source Range Neutron Flux Monitors _(2)_ required to be OPERABLE.

A. (1) is required to be in Containment

   (2) are NOT

B. (1) is required to be in Containment

   (2) ARE

C. (1) may be in the Control Room in direct Communication with Containment

   (2) are NOT

D. (1) may be in the Control Room in direct Communication with Containment

   (2) ARE

95. Given the following:

- Unit 1 is preparing to enter Mid-Loop prior to core offload and the following conditions exist:
  - Maintenance on the 1C Condensate pump is in progress.
  - Southeast Division is performing maintenance in the 500 kV Switchyard.

Which one of the following completes the statements below per NMP-OS-010, Protected Train/Division and Protected Equipment Program?

Work on the 1C Condensate pump __(1)__ required to be re-approved in the form of a GREEN SHEET.

Work in the 500kV switchyard __(2)__ required to be re-approved in the form of a GREEN SHEET.

	(1)	(2)
A.	IS	IS
B.	IS	is NOT
C.	is NOT	IS
D.	is NOT	is NOT

96. Given the following:

- Unit 1 is at 100% reactor power.
- The following RWST parameters are recorded:

  - Temperature is 47°F.
  - LI 4075A and B, indicate 30 FT.

Which one of the following completes the statements below?

Tech Spec action is required for RWST __(1)__.

The Tech Spec Basis for this parameter limit is to ensure __(2)__.

A. (1) Level

   (2) sufficient borated water to support the ECCS during the injection phase of a design basis **main steam line break**

B. (1) Level

   (2) sufficient borated water to support the ECCS during the injection phase of a design basis **loss of coolant accident**

C. (1) Temperature

   (2) that the amount of cooling provided from the RWST during the heatup phase of a **main steam line break** is consistent with safety analysis assumptions

D. (1) Temperature

   (2) that the amount of cooling provided from the RWST during the heatup phase of a **main feed line break** is consistent with safety analysis assumptions

97. Given the following:

- Unit 2 is operating at 12%.
- A team is entering CTMT to investigate a minor RCS leak.
- The team will enter inside the bio-wall shield as part of the search area.

Which one of the following completes the statements below?

Per FNP-2-RCP-11, the Shift Supervisor __(1)__ required to maintain power constant.

After performing the radiological briefing required by NMP-HS-302-001, Radiological Key Control, the RP Lead Technician __(2)__ required to obtain **additional** authorization from more senior management **prior** to issuing the key to access Containment for this evolution.

Nomenclature: FNP-2-RCP-11, Checklist for Unit 2 Containment Entry At Power (Critical) and For Initial Entry After Reactor Shutdown (Non-Critical) and Guidelines For Containment Postings During Outages.

	(1)	(2)
A.	is NOT	is NOT
B.	is NOT	IS
C.	IS	is NOT
D.	IS	IS

98. Given the following:

- A General Emergency has been declared.
- The TSC and EOF are **not** functional.

Per the Southern Nuclear Company Standard Emergency Plan, which one of the following duties **can** the Site Manager/interim Emergency Director delegate?

A. Conducting a Site Evacuation.

B. Approval of subsequent and/or updated (not initial) Protective Action Recommendations to offsite organizations

C. Approval of official notifications to the NRC (separate from state and local notifications).

D. Authorization of issuance of potassium iodide (KI) to plant employees.

99. Given the following:

- An inadvertent actuation of the fire protection system has occurred in the cable spreading room on Unit 1.
- Charging flow is erratic.

Subsequently,

- An spurious Reactor trip occurs on Unit 1.

Which one of the following completes the statement below?

The Unit 1 operating crew is required to ___.

Nomenclature: EEP-0, Reactor Trip or Safety Injection
AOP-28.1, Fire or Inadvertent Fire Protection System Actuation in the Cable Spreading Room

A. perform EEP-0 ONLY

B. perform AOP-28.1, ONLY

C. perform AOP-28.1 **and** EEP-0 in parallel

D. complete EEP-0 immediate operator actions first then transition to AOP-28.1

100. Given the following:

At 1000

- FRP-H.1, Response to Loss of Secondary Heat Sink is in progress on Unit 1 following a spurious Reactor trip.
- Bleed and feed is in progress and the crew is attempting to restore AFW.

At 1015

- The TDAFW pump is started and supplying 450 gpm of AFW flow.

At 1045

- The crew is evaluating heat sink with the following conditions:
  - SG NR levels as follows:
    - 1A: 28% and rising
    - 1B: 0%
    - 1C: 50% and rising
  - CETCs and Hot Leg temperatures are lowering.

Which one of the following completes the statements below?

Based on the conditions at **1045**, Secondary heat sink _(1)_ adequate to secure bleed and feed.

When actions in FRP- H.1 are complete, the crew is required to transition to _(2)_.

Nomenclature: ESP-1.1, SI Termination

	(1)	(2)
A.	is NOT	ESP-1.1 step 8
B.	IS	ESP-1.1 step 8
C.	is NOT	the procedure and step in effect
D.	IS	the procedure and step in effect

16.2 Determine minimum required RCS subcooling for stopping one charging pump AND proceed to step 16.3.

CHG PUMPs Started in SI Mode	Any RCP Started	Required Subcooling
3	YES	19°F {51°F}
	NO	21°F {53°F}
2	YES	35°F {84°F}
	NO	47°F {93°F}

Step 16 continued on next page.

ATTACHMENT 3

FIGURE 1

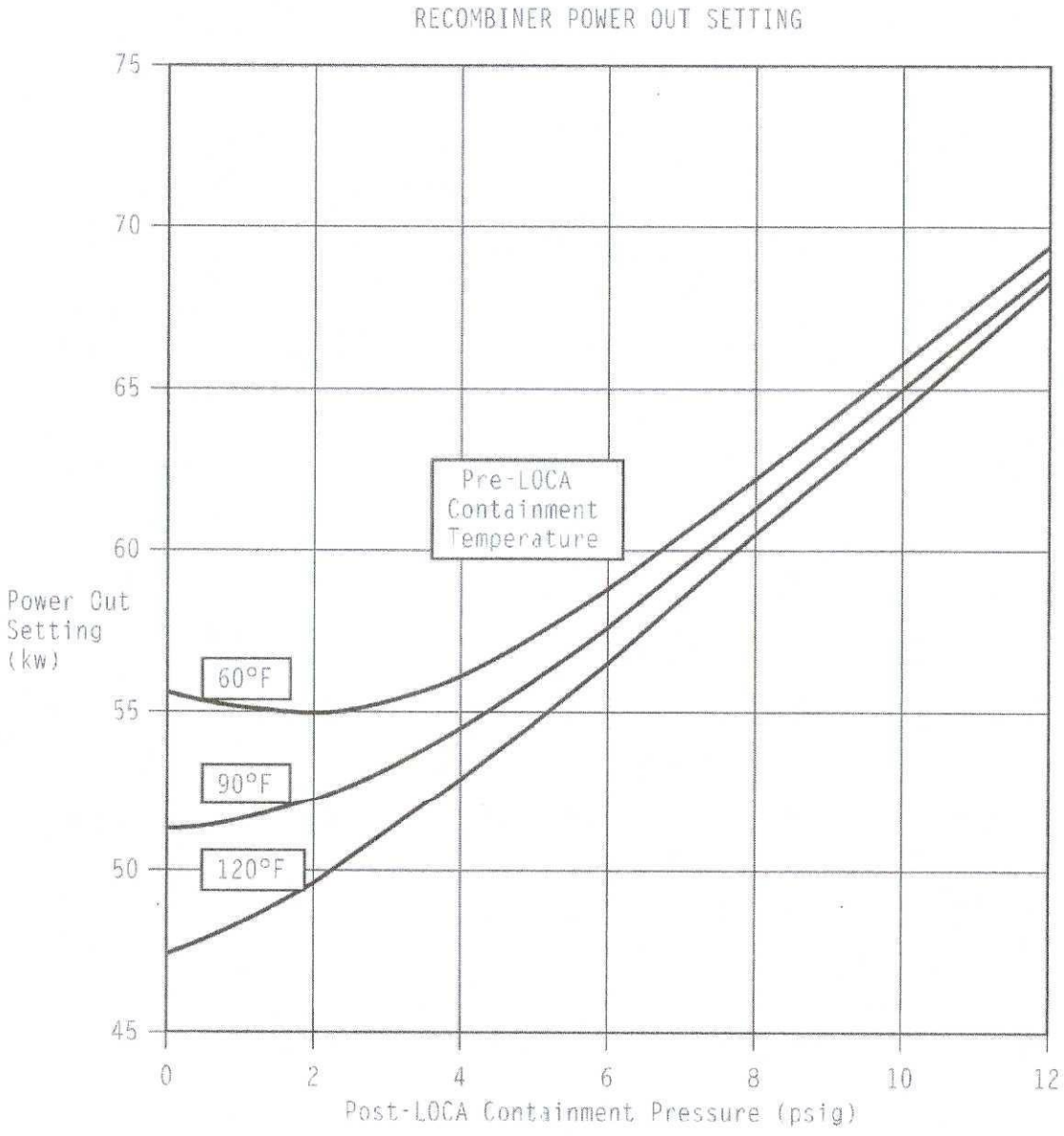
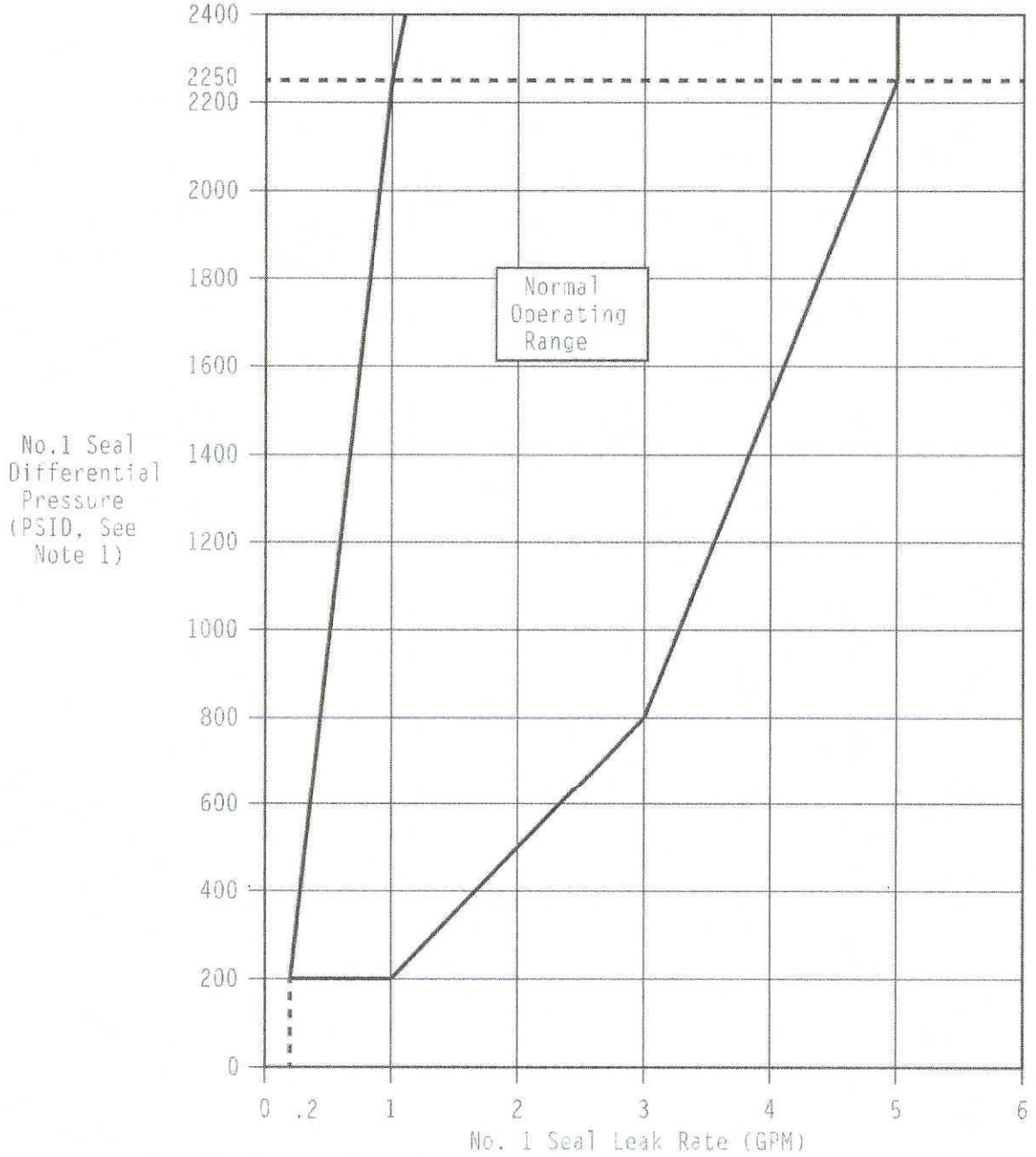


FIGURE 1

NO. 1 SEAL NORMAL OPERATING RANGE



Note 1: For No. 1 Seal Differential Pressures greater than 400 psid, use RCS pressure in psig.

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8.	Immediately
C. One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.3-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.3-1.	F.1 Initiate action in accordance with Specification 5.6.8.	Immediately

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION D.1
1. RCS Hot Leg Temperature (Wide Range)	2	E
2. RCS Cold Leg Temperature (Wide Range)	2	E
3. RCS Pressure (Wide Range)	2	E
4. Steam Generator (SG) Water Level (Wide or Narrow Range)	2/SG	E
5. Refueling Water Storage Tank Level	2	E
6. Containment Pressure (Narrow Range)	2	E
7. Pressurizer Water Level	2	E
8. Steam Line Pressure	2/SG	E
9. Auxiliary Feedwater Flow Rate	2	E
10. RCS Subcooling Margin Monitor	2	E
11. Containment Water Level (Wide Range)	2	E
12. Core Exit Temperature - Quadrant 1	2(a)	E
13. Core Exit Temperature - Quadrant 2	2(a)	E
14. Core Exit Temperature - Quadrant 3	2(a)	E
15. Core Exit Temperature - Quadrant 4	2(a)	E
16. Reactor Vessel Level Indicating System	2	F
17. Condensate Storage Tank Level	2	E
18. Deleted		
19. Containment Area Radiation (High Range)	2	F

(a) A channel consists of two core exit thermocouples.

Step	Action/Expected Response	Response NOT Obtained

10.2 Determine number of containment spray pumps required based on the Table below.

RWST LEVEL	CONTAINMENT PRESSURE	FAN COOLERS RUNNING IN EMERGENCY MODE	SPRAY PUMPS REQUIRED
GREATER THAN 12.5 FT	GREATER THAN 54 PSIG	--	2
	BETWEEN 27 PSIG AND 54 PSIG	0, 1	2
		2, 3	1
		4	0
	LESS THAN 27 PSIG	--	0
BETWEEN 4.5 FT and 12.5 FT	GREATER THAN 54 PSIG	--	2
	BETWEEN 27 PSIG and 54 PSIG	1, 2	1
		3, 4	0
	LESS THAN 27 PSIG	--	0
LESS THAN 4.5 FT	--	--	0

10.3 Establish required number of running containment spray pumps.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One containment cooling train inoperable.	C.1 Restore containment cooling train to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
D. Two containment cooling trains inoperable.	D.1 Restore one containment cooling train to OPERABLE status.	72 hours

Containment Barrier	
Loss	**Potential Loss**
A. A leaking (>25gpm) or RUPTURED SG is FAULTED outside of containment.	Not Applicable
Not Applicable	A. Core Cooling CSF-RED entry conditions met for 15 minutes or longer. (Note1)
Not Applicable	A. Containment radiation monitor RE-27 A **OR** B greater than 7970 R/Hr.
A. Containment isolation is required **AND** **EITHER** of the following: 1. Containment integrity has been lost based on Emergency Director judgement. 2. UNISOLABLE pathway from containment to the environment exists. **OR** B. Indications of RCS leakage outside of containment as indicated by alarms on any of the following instruments (Note 9): • RE-10 • RE-29B • RE-29C	A. Containment CSF-RED entry conditions met. **OR** B. CTMT hydrogen concentration greater than 6%. **OR** C.1. Containment pressure greater than 27 psig. **AND** 2. Less than one CTMT fan cooler is operating per design for 15 minutes or longer. **AND** 3. Less than one full train of CTMT Spray is operating per design for 15 minutes or longer. (Note1)
A. **ANY** condition in the opinion of the Emergency Director that indicates loss of the containment barrier.	A. **ANY** condition in the opinion of the Emergency Director that indicates potential loss of the containment barrier.

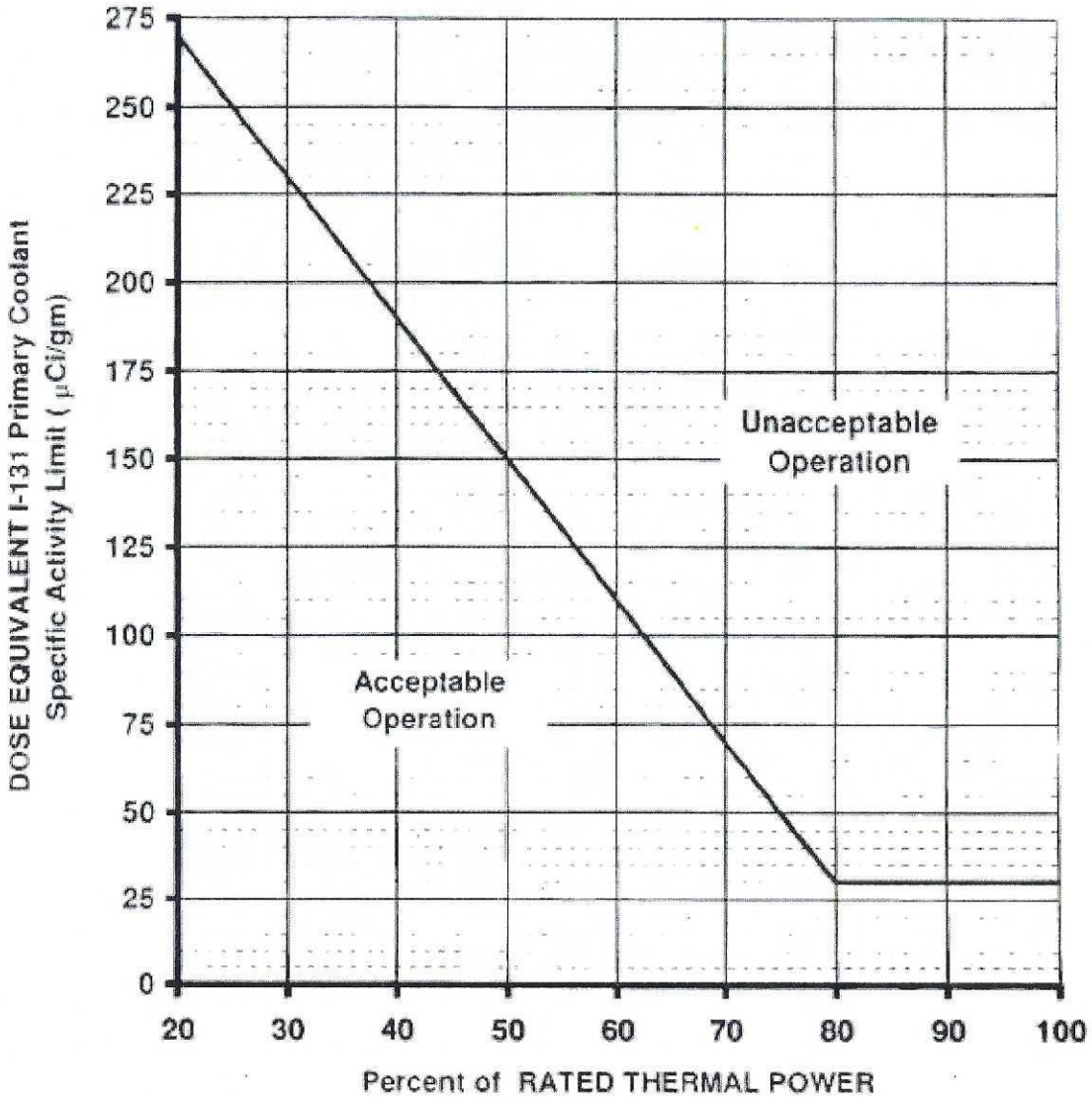


Figure 3.4.16-1

DOSE EQUIVALENT I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity > 0.5 μCi/gm DOSE EQUIVALENT I-131.

SU3 Reactor coolant activity greater than Technical Specification allowable limits.

1	2	3	4			

(1)

RCS coolant sample activity value indicating fuel clad degradation greater than Technical Specification allowable limits as indicated by **ANY** of the following:

Dose Equivalent I-131 greater than 0.5 μCi/gm for greater than 48 hours
Dose Equivalent I-131 greater than Technical Specification figure 3.4.16-1. **IF** less than 20% power, **THEN** use Dose Equivalent I-131 20% power limit on Technical Specifications Figure 3.4.16-1.
RCS specific activity greater than 100/Ē μCi/gm.

FARLEY Nuclear Plant 2023-301 Written Exam Answer Key

As of July 20, 2023, and Final Resolution of Post-Exam Comments

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

30. A
31. B
32. A
33. C
34. A
35. D
36. A
37. D
38. D
39. A
40. A
41. A
42. D
43. A
44. A
45. B
46. C
47. B
48. B
49. B
50. A
51. B
52. A
53. D
54. A
55. B
56. D
57. B
58. A
59. D
60. D
61. C

62. A
63. B
64. C
65. C
66. D
67. B
68. A
69. C
70. C
71. C
72. B
73. D
74. B
75. D

--- SRO-Only Written Exam Questions ---

76. D
77. A
78. C
79. B
80. D
81. B
82. C
83. A
84. D
85. D
86. B
87. C
88. C
89. DELETED from Exam (post-exam comment resolution), originally 'C'

90. D
91. DELETED from Exam (post-exam comment resolution), originally ‘D’
92. B
93. A
94. B
95. A
96. B
97. D
98. A
99. B
100. B