

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

Name:

Date:

Facility/Unit: Farley Nuclear Plant

Region:

I ☐

II

☒

III

☐

IV

☐

Reactor Type: W

☒

CE

☐

BW

☐

GE

☐

Start Time:

Finish Time:

Instructions

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

Applicant Certification

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

Applicant's Signature**Results**

RO/SRO-Only/Total Examination Values

____ / ____ / ____ Points

Applicant's Scores

____ / ____ / ____ Points

Applicant's Grade

____ / ____ / ____ Percent

1. Unit 1 is at 74% power and stable, and the following conditions occurred:

At 1000:

- Rod control is in AUTO.
- TI-408A, Tavg - Tref deviation, indicates 0°F and stable.
- Pressurizer level is stable.
- Reactor Power is approximately 75% and stable.
- Control Bank D step counters are at 144 steps.

At 1002:

- TI-408A, Tavg - Tref deviation, indicates approximately +2°F and rising.
- Pressurizer level is slowly rising.
- Pressurizer spray valves have throttled open.
- Reactor Power is approximately 76% and slowly rising.
- Control Bank D step counters are at 150 steps and rising at 8 steps per minute.
- There is no load change in progress.

Which one of the following describes:

1) the event in progress

and

2) the **NEXT** action that must be performed IAW AOP-19.0, Malfunction of Rod Control System?

A. 1) Inadvertent RCS boration;

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

B. 1) Inadvertent RCS boration;

2) Place the rod control mode selector switch to MANUAL and match Tavg with Tref by inserting rods.

C. 1) Uncontrolled Continuous Rod Withdrawal;

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

D. 1) Uncontrolled Continuous Rod Withdrawal;

2) Place the rod control mode selector switch to MANUAL and verify that rod motion stops.

2. Which one of the following correctly describes components in the power flow path to the Reactor Trip Breakers?

The 600V (1) supply the CRDM MG set supply breakers, then the (2), then the Reactor trip breakers.

(1)

(2)

A. LCCs D and E

Motor Generator Sets, then the Power Cabinets

B. MCCs A and B

Motor Generator Sets, then the Power Cabinets

C. LCCs D and E

Motor Generator Sets

D. MCCs A and B

Motor Generator Sets

3. Unit 1 is at 25% power and the following conditions occurred:

At 1000:

- 1A RCP amps and motor winding temperature were observed to be rising while 1A RCS LOOP flow was decreasing.

At 1002:

- EF1, 1A RCS LOOP FLOW LO OR 1A RCP BKR OPEN, is in alarm.
- 1A RCP Handswitch indicating Green and Amber lights are LIT, the Red light is **NOT** LIT.
- AOP-4.0, Loss Of Reactor Coolant Flow, immediate actions have been completed.

RCS Temperatures are:

- 1A RCS LOOP Tavg is 537°F.
- 1B RCS LOOP Tavg is 553°F.
- 1C RCS LOOP Tavg is 553°F.

Which one of the following correctly describes the **CAUSE** of these indications and the **ACTION** required IAW AOP-4.0?

CAUSE

ACTION

- | | |
|-------------------------|----------------------------------|
| A. Seized motor bearing | Trip the Reactor |
| B. Sheared shaft | Trip the Reactor |
| C. Seized motor bearing | Commence Normal Reactor Shutdown |
| D. Sheared shaft | Commence Normal Reactor Shutdown |

4. A LOCA and LOSP has occurred on Unit 1, and the following conditions occurred:

- FRP-C.2, Response To Degraded Core Cooling, is in progress.
- CCW to ALL the RCPs thermal barriers has been lost.
- All charging pumps have tripped.
- All RCP's are secured.
- The five hottest CETCs are; 773°F, 779°F, 1023°F, 1252°F, 1508°F and all stable.
- All SG pressures are at 1000 psig.
- Off-Site Power is available.

Which one of the following states:

- 1) the FRP that must be in effect for the conditions given (FRP-C.2 Response To Degraded Core Cooling, **OR** FRP-C.1 Response To Inadequate Core Cooling), and
- 2) whether the RCPs are required or **NOT** required to be started?

- | | |
|----------------------|--|
| A. Enter FRP-C.1 | RCPs are required to be started |
| B. Enter FRP-C.1 | RCPs are NOT required to be started |
| C. Remain in FRP-C.2 | RCPs are required to be started |
| D. Remain in FRP-C.2 | RCPs are NOT required to be started |

5. Unit 1 is at 100%, and the following conditions occurred:

- One Letdown orifice is on service.
- LK-459F, PRZR LVL, controller demand has failed high.

Which one of the following describes the effect on Charging Flow and RCP Seal Injection flows, **with no operator actions**?

	<u>Charging Flow</u>	<u>Seal injection Flows</u>
A.	Go up	Go Down
B.	Go up	Go up
C.	Go Down	Go up
D.	Go Down	Go Down

6. A time stroke of Q1E11MOV8889, RHR TO RCS HOT LEGS ISO, in the open direction has been performed per STP-11.6, Residual Heat Removal Valves Inservice Test.

Open direction ACCEPTABLE STROKE TIME RANGE is 9.96 to 13.47 Sec.

Open direction MAXIMUM ALLOWABLE TIME is 16 Sec.

Stroke times obtained were as follows:

- **At 1000** First time stroke: 15.35 Secs
- **At 1005** Second time stroke: 15.52 Secs

Which one of the following describes MOV-8889 OPERABILITY IAW Technical Specifications and the actions that are required to be placed in a CR for these results IAW STP-11.6?

- A. • MOV-8889 is OPERABLE
 - Analysis of the time stroke results within 96 hours to determine if new stroke time is acceptable.
- B. • MOV-8889 is INOPERABLE
 - Analysis of the time stroke results within 96 hours to determine if new stroke time is acceptable.
- C. • MOV-8889 is OPERABLE
 - Repair or replacement of MOV8889.
- D. • MOV-8889 is INOPERABLE
 - Repair or replacement of MOV8889.

7. Unit 1 is performing a plant cooldown using the A Train RHR system, and the following conditions occurred:

- HIK-603A, 1A RHR HX DISCH VLV, controller demand is at 50%.
- FK-605A, 1A RHR HX BYP FLOW, controller is in **AUTO** with demand at 50%.

At 1000:

- HIK-603A demand setting is increased to 60%.

At 1005:

- RHR system flow is stable.

At 1010:

- FCV-605A is in its failed position due to an instrument air line break.

Which one of the following describes RHR flow at **1005**, and the position of FCV-605A at **1010**, **with no operator actions**:

RHR flow indicated on FI-605A at **1005** is (1) it was before **1000**,

and

the position of FCV-605A at **1010** is (2) ?

At 1005

FI-605A, RHR HDR FLOW

At 1010

FCV-605A, 1A RHR HX BYP FLOW

- A. higher than
- B. the same as
- C. higher than
- D. the same as

- Closed
- Open
- Open
- Closed

8. A Small Break LOCA has occurred on Unit 1, and the following conditions occurred:

- A reactor trip and safety injection is in progress.
- 1A Charging Pump failed to auto start.
- 1C Charging Pump is the only charging pump running.
- RCS pressure is 1000 psig.

Which one of the following states the Safety Injection flow indication on FI-943, A TRN HHSI FLOW, **with no operator action**?

Safety Injection flow is approximately_____.

- A. 0 gpm
- B. 150 gpm
- C. 450 gpm
- D. 800 gpm

9. Unit 2 is in Mode 5, and the following conditions occurred:

- PI-472, PRT PRESS, reads 7.5 psig and is rising slowly.
- LI-470, PRT LVL, reads 78% and is rising slowly.
- RCS Pressure is 225 psig.
- A Train RHR is aligned in the RCS Cooldown Operation IAW SOP-7.0, Residual Heat Removal System.
- It has been determined that V8708A, A Train RHR Pump suction relief valve, is leaking by the seat.

Which one of the following correctly states the impact on the PRT **with no operator action** and the required procedure actions to mitigate this condition per SOP-1.2, Reactor Coolant Pressure Relief System?

The PRT Pressure will reach a maximum pressure of (1) psig,
and

to prevent reaching the PRT maximum pressure, the operator will be
directed to (2) per SOP-1.2, Reactor Coolant Pressure Relief System.

- A. (1) 150 psig.
 (2) pump down the PRT with the RCDDT pump.
- B. (1) 150 psig.
 (2) gravity drain the PRT to the WHT.
- C. (1) 100 psig.
 (2) gravity drain the PRT to the WHT.
- D. (1) 100 psig.
 (2) pump down the PRT with the RCDDT pump.

10. Unit 1 was at 100% power, and the following conditions occurred:

- FRP-S.1, Response To Nuclear Power Generation – ATWT, is in progress.
- The Main Turbine was unable to be tripped from the MCB.
- A Safety Injection (SI) has **NOT** occurred.
- RCS pressure is 2230 psig.
- Tavg is 563°F.

Which one of the following describes the **immediate** effects if the Reactor Trip Breakers are opened locally at this time?

- A. • The Block of an Auto SI will be allowed.
 - The Feed Water Reg Valves will trip closed.
- B. • The Block of an Auto SI will be allowed.
 - The Steam Flow high setpoint will be reset.
- C. • The Main Turbine will trip.
 - The Feed Water Reg Valves will trip closed.
- D. • The Main Turbine will trip.
 - The Steam Flow high setpoint will be reset.

11. Unit 1 has manually initiated a Safety Injection due to rapidly falling pressurizer pressure, and the following conditions occurred:

At 1000:

- Pressurizer level 35% and rising.
- RCS pressure 1700 psig and falling.
- PRT level is 73% and pressure is 5 psig and stable.
- TI-453, PORV downstream temperature, is 117°F.
- TI-453, Safety Valve downstream temperature, is 101°F.
- TI-453, Safety Valve downstream temperature, is 101°F.
- TI-453, Safety Valve downstream temperature, is 102°F.
- Containment Pressure 0.2 psig and slowly rising.
- The following radiation monitors are in alarm:
R-2, CTMT 155 FT, R-7, SEAL TABLE, R-11, CTMT ATMOS, and
R-12, CTMT GAS

At 1015:

Transition is made to EEP-1.0, Loss of Reactor or Secondary Coolant, and the following conditions exist:

- Pressurizer level 99% and rising.
- RCS pressure 1400 psig and rising.
- PRT level is 73% and pressure is 5 psig and stable.
- TI-453, PORV downstream temperature, is 138°F and rising.
- TI-455, Safety Valve downstream temperature, is 125°F and rising.
- TI-457, Safety Valve downstream temperature, is 125°F and rising.
- TI-459, Safety Valve downstream temperature, is 126°F and rising.
- Containment Pressure 0.96 psig and rising.
- Containment sump level is rising slowly.
- R-2, 7, 11 and 12 are still in alarm.

Which one of the following states **only** potential sources of the RCS leak indicated by the given conditions?

- | | |
|---------------------------------------|----------------------------|
| A. PORV leakby | Safety valve leakby |
| B. PORV leakby | PRZR Level upper tap break |
| C. PRZR Steam Space sample line break | Safety valve leakby |
| D. PRZR Steam Space sample line break | PRZR Level upper tap break |

12. Unit 1 is at 100% power and the following occurred:

- TK-144, LTDN HX OUTLET TEMP controller, demand failed high.

Which one of the following describes the impact on the Letdown System Temperature, and what type of reactivity will be added to the core?

- A. • Higher Letdown temperature.
 - Positive reactivity.
- B. • Higher Letdown temperature.
 - Negative reactivity.
- C. • Lower Letdown temperature.
 - Positive reactivity.
- D. • Lower Letdown temperature.
 - Negative reactivity.

13. Unit 1 was operating at 100% power, and the following conditions occurred:

At 1000:

- A Train is the "On Service" train.
- 1B CCW pump is running and supplying loads in the on-service train.
- 1A CCW pump is running to support charging pump operations.
- 1C CCW pump is aligned and OPERABLE.

At 1005:

- A Safety Injection and LOSP occurred simultaneously.

Which one of the following combinations of CCW pumps will be running following the operation of the ESF sequencers, **with no operator actions**?

- A. 1A and 1C CCW pumps ONLY.
- B. 1B and 1C CCW pumps ONLY.
- C. 1A and 1B CCW pumps ONLY.
- D. 1A and 1B and 1C CCW pumps.

14. Unit 1 has experienced a Small Break LOCA, and the following conditions occurred:

At 1000:

- ESP-1.2, Post LOCA Cooldown and Depressurization, is in progress.
- Normal Charging has been established.

At 1010:

- CTMT Pressure is 6 psig and rising.
- Subcooling is 24°F and decreasing.
- PRZR Level is 28% and decreasing.

Which one of the following is the required action IAW ESP-1.2?

- A. FK-122, CHG FLOW, must be adjusted to raise Przr level.
- B. Place the SI ACTUATION switch to ACTUATE.
- C. FK-122, CHG FLOW, must be adjusted to maintain current Przr level.
- D. HHSI flow must be established and additional CHG PUMPs started.

15. Unit 1 was at 28% power and the following conditions occurred:

- All PRZR Backup Heaters are in AUTO.
- A CVCS Malfunction has occurred.
- FK-122, CHG FLOW, has been placed in manual.
- PRZR level is at 36% and rising.

Which one of the following describes the operation of the Backup Heaters and the Spray valve controllers' demand **with no operator actions**?

All PRZR Backup Heaters will be (1)

and

PK-444C and D, 1A and 1B LOOP SPRAY VLV controllers' demand go (2) .

	<u> (1) </u>	<u> (2) </u>
A.	ON	Up
B.	ON	Down
C.	OFF	Up
D.	OFF	Down

16. Unit 1 is at 100% power, and the following conditions exist:

- PRZR LVL CONT CH, LS/459Z, is in the "I/II LT459/60" position.
 - A failure of the controlling pressurizer level transmitter has occurred.
 - AOP-100, Instrumentation Malfunction, is in progress.
 - Tavg is 573.0°F.
 - FK-122, CHG FLOW, controller is in Manual.
 - Przr level is 40% and rising.
 - Charging flow is 125 gpm.
 - Letdown flow is 130 gpm.
- | | | | |
|-----------------------------|-----------|-----------|-----------|
| | <u>1A</u> | <u>1B</u> | <u>1C</u> |
| • Seal Injection flows are: | 8.1 gpm | 7.9 gpm | 8.0 gpm |
| • Seal Leakoff Flows are: | 2.9 gpm | 3.0 gpm | 3.1 gpm |

Which one of the following is the:

1) approximate time that it will take for the Pressurizer level to get to program level **at the current rate in Manual control**,

and

2) the correct switch position for PRZR LVL CONT CH LS/459Z IAW AOP-100?

<u>Time</u>	<u>Switch position</u>
A. 56 Minutes	I/III, LT459/61
B. 94 Minutes	I/III, LT459/61
C. 56 Minutes	III/II, LT461/60
D. 94 Minutes	III/II, LT461/60

17. A loss of 'A' Train Auxiliary Building 125V DC Bus has occurred on Unit 1.

If the plant experienced a problem which required manually tripping the reactor, which one of the following describes the effect (on any closed Reactor Trip and/or Bypass breakers) of placing the RX TRIP ACTUATION switch on the MCB to TRIP?

Placing the MCB handswitch in TRIP would _____ if they were closed.

- A. open ALL reactor trip and bypass breakers.
- B. ONLY open the 'A' reactor trip breaker and the 'B' reactor trip bypass breaker.
- C. ONLY open the 'B' reactor trip breaker and the 'A' reactor trip bypass breaker.
- D. open BOTH reactor trip breakers but NOT open either reactor trip bypass breaker.

18. Unit 2 is at 100% power, and the following conditions occurred:

- PT-455, PRZR PRESS, has failed off-scale HIGH.
- All bistables associated with PT-455 in Table 1 of AOP-100, Instrument Malfunction, have been placed in the trip condition per Tech Spec 3.3.1.

Which one of the following identifies the **MINIMUM** additional bistable channels required to meet the coincidence for RPS and ESF actuation logic to initiate any reactor trip and any safety injection on Pressurizer Pressure?

A **MINIMUM** of (1) additional Pressurizer Pressure channel(s) failing **HIGH** will cause a Reactor Trip,

and

a **MINIMUM** of (2) additional Pressurizer Pressure channel(s) failing **LOW** will cause a Safety Injection.

	<u>(1)</u>	<u>(2)</u>
A.	1	1
B.	1	2
C.	2	1
D.	2	2

19. A loss of B Train Auxiliary Building 125V DC Bus has occurred on Unit 1.

Which one of the following is the correct impact on B Train ESF Equipment control?

The B Train SI actuated MOVs (1) automatically stroke upon an SI actuation,
and

B Train ESF pumps (2) be started in LOCAL at the HSP.

- | | <u> (1) </u> | <u> (2) </u> |
|----|-----------------|----------------|
| A. | will | can |
| B. | will | can NOT |
| C. | will NOT | can |
| D. | will NOT | can NOT |

20. Unit 2 was operating at 100% power, and the following conditions have occurred:

- PT-950, CTMT PRESS, has failed.
- PT-950, HI-3 bistable, is in the BYPASS condition.
- Subsequently, the 2D vital panel has become de-energized.

If a Large Break LOCA occurs, which one of the following describes:

1) the number of channels of HI-3 bistables which will be actuated

and

2) the number of trains of containment spray (CS) that actuate automatically?

A. 1) Two channels ONLY will be actuated.

2) One train ONLY will actuate.

B. 1) Two channels ONLY will be actuated.

2) Two trains will actuate.

C. 1) Three channels will be actuated.

2) One train ONLY will actuate.

D. 1) Three channels will be actuated.

2) Two trains will actuate.

21. Unit 1 is at 20% power and conditions are as follows:

At 1000:

	<u>1A</u>	<u>1B</u>	<u>1C</u>
• RCP amps :	670	680	690

At 1005:

- | | | | |
|-------------|-----------|-----------|-----------|
| | <u>1A</u> | <u>1B</u> | <u>1C</u> |
| • RCP amps: | 670 | 680 | 0 |
- EF3, 1C RCS LOOP FLOW LO OR 1C RCP BKR OPEN, is in alarm.

Which one of the following describes the expected indications on 1A RCS LOOP and 1C RCS LOOP **stable** flow rates at 1010?

	<u>1A RCS LOOP Flow rate</u>	<u>1C RCS LOOP Flow rate</u>
A.	105%	0%
B.	105%	10%
C.	105%	< 0%
D.	100%	0%

22. Unit 2 is at 100%, and the following conditions occurred:

At 1000:

- The Containment Cooling system is in the normal mode of operation per SOP-12.1, Containment Air Cooling System.
- Containment temperature is slowly rising.

At 1100:

- The crew has configured the containment cooling system per SOP-12.1.
- The emergency service water from CTMT coolers; MOVs 3024A, B, C and D are OPEN per SOP-12.1.
- Containment temperature is 115°F and slowly rising.

Which one of the following correctly states whether or not an ACTION STATEMENT is required to be entered for Tech Spec 3.6.5, Containment Temperature, and the required Containment Cooling Fans speed per SOP-12.1?

An ACTION STATEMENT for TS 3.6.5 is (1) to be entered,

and

the Containment Cooling Fans are required to be operated in (2) speed per SOP-12.1.

	<u>(1)</u>	<u>(2)</u>
A.	required	FAST
B.	required	SLOW
C.	NOT required	FAST
D.	NOT required	SLOW

23. Unit 1 Reactor has just tripped, and the following conditions occurred:

- All three RCPs have just tripped.
- All Charging has been lost.

Which one of the following correctly states the reason for maintaining CCW cooling flow to the Thermal Barrier HX in this condition?

Maintaining CCW cooling flow to the Thermal Barrier HX will prevent the RCP (1) from starting to degrade due to overheating in as early as (2).

<u>(1)</u>	<u>(2)</u>
A. #1 seal	2 minutes
B. #1 seal	13 minutes
C. lower radial bearing	2 minutes
D. lower radial bearing	13 minutes

24. Unit 1 is in Mode 3, and the following conditions occurred:

- A loss of both Trains of CCW has occurred.
- AOP-9.0, Loss Of Component Cooling Water, is in progress.
- Attachment 1, Establishing Firewater Cooling to a Charging Pump, is in progress.

Which one of the following states the CCW temperature at which isolation of the CCW return from the RCP thermal barrier is required, and the number of charging pumps which will be aligned to Firewater Cooling IAW AOP-9.0, Attachment 1?

Isolating the CCW return from the RCP thermal barriers is required when CCW temperature is greater than (1),

and

Firewater Cooling will be aligned to (2) charging pump(s) IAW AOP-9.0, Attachment 1.

	<u>(1)</u>	<u>(2)</u>
A.	105°F	1
B.	130°F	1
C.	105°F	3
D.	130°F	3

25. A Unit 1 Safety Injection is in progress due to a Large Break LOCA.

Which one of the following describes the connection(s) between the RWST, A Train CS and ECCS pumps suction, and the operation of MOV-8827A and MOV-8826A, CTMT SUMP TO 1A CS PUMP valves?

A Train CS Pump, A Train HHSI Pump, and the A Train RHR Pump have
____(1)____ suction header(s) penetrating the RWST,

and

the CS Sump suction valves ____ (2) ____ automatically open on a LO-LO RWST condition.

____(1)____

____(2)____

- | | | |
|----|------------|-----------------|
| A. | separate | will NOT |
| B. | one common | will |
| C. | separate | will |
| D. | one common | will NOT |

26. Unit 2 is at 50% power, and PT-444, PRZR PRESS, pressure transmitter has failed to the **2230 psig** position.

Which one of the following describes the effects on PK-444A, PRZR PRESS REFERENCE controller, and the pressurizer liquid density due to this malfunction?

PK-444A controller demand goes (1),

and

the density of the pressurizer liquid goes (2).

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|------------|
| A. | down | up |
| B. | down | down |
| C. | up | up |
| D. | up | down |

27. Which one of the following correctly states how the Containment Spray System reduces radioactive iodine in the Containment atmosphere during a LOCA?

To enhance absorption of Iodine from the Containment atmosphere, the Containment Spray System sprays water from the (1) at a pH of approximately (2) .

<u> (1) </u>	<u> (2) </u>
A. containment sump	4.5
B. RWST	7.5
C. containment sump	7.5
D. RWST	4.5

28. Unit 2 has experienced an Anticipated Transient Without Trip (ATWT) and the following plant conditions occurred:

- Charging Flow is 68 gpm.
- 2A Boric Acid Transfer Pump is tagged out.
- Safety Injection has **NOT** actuated at this time.
- IAW FRP-S.1, Response to Nuclear Power Generation – ATWT, the UO is establishing Emergency Boration.
- 2B Boric Acid Transfer Pump tripped when it was started.

Which one of the following states:

1) the required actions to establish an emergency boration flow path,
and

2) the required action(s) for FK-122, CHG FLOW controller, IAW FRP-S.1?

A. 1) Open V185, MAN EMERG BORATION valve, AND open FCV-113A, BORIC ACID TO BLENDER valve.

2) Place FK-122 in MAN and maintain current demand.

B. 1) Open LCV-115B and D, RWST TO CHG PUMP valves, AND close LCV-115C and E, VCT OUTLET ISO valves.

2) Place FK-122 in MAN **AND** raise demand.

C. 1) Open V185, MAN EMERG BORATION valve, AND open FCV-113A, BORIC ACID TO BLENDER valve.

2) Place FK-122 in MAN **AND** raise demand.

D. 1) Open LCV-115B and D, RWST TO CHG PUMP valves, AND close LCV-115C and E, VCT OUTLET ISO valves.

2) Place FK-122 in MAN and maintain current demand.

29. Unit 1 is at 100%, and the following conditions occurred:

- Intermediate Range Channel N-35 lost compensating voltage.
- I&C is called to investigate.
- Prior to any action by I&C, a reactor trip occurs.

Which one of the following describes the Source Range NI detectors response after the trip, and the required actions IAW ESP-0.1, Reactor Trip Response?

Source Range Instruments will (1); and they must be manually (2).

- A. (1) automatically energize prematurely
(2) de-energized until approximately 5 minutes post-trip.
- B. (1) automatically energize prematurely
(2) de-energized until approximately 15 minutes post-trip.
- C. (1) **NOT** automatically energize when required
(2) energized approximately 5 minutes post-trip.
- D. (1) **NOT** automatically energize when required
(2) energized approximately 15 minutes post-trip.

30. Unit 1 has experienced a Loss of Offsite Power and a Tube Rupture on the 1A SG, and the following conditions exist:

- RCS cooldown at the maximum obtainable rate is in progress IAW EEP-3, Steam Generator Tube Rupture.
- INTEGRITY Critical Safety Function Status Tree has turned ORANGE due to the 1A RCS LOOP cold leg temperature dropping rapidly.

Which one of the following describes the reason the 1A RCS LOOP cold leg temperature has dropped rapidly?

1A RCS Loop flow has _____

- A. increased, moving the cold 1A SG U-tube water past the T_{COLD} instruments.
- B. restarted, causing a sudden rise then rapid drop in temperature as the stagnant water from the hot leg is flushed through the loop.
- C. reversed, causing the cold water from 1B and 1C loops to pass over the T_{COLD} instruments in 1A loop.
- D. stopped, allowing the cold Safety Injection water to pass over the T_{COLD} instruments.

31. Unit 1 is at 12% power, and the following conditions exist:

- R-15A, SJAE EXH, has a red Low Alarm light LIT, and is reading 10 cpm.
- 1A SG has developed a 10 gpm tube leak.

Which one of the following radiation monitors will provide the **EARLIEST** indication of the 1A SG Tube leak?

- A. R-15A, SJAE EXH, alarm.
- B. R-19, SGBD SAMPLE, alarm.
- C. R-23B, SGBD TO DILUTION, alarm.
- D. R-70A, 1A SG TUBE LEAK DET, alarm.

32. Unit 1 has been manually Tripped and Safety Injected from 14% power IAW AOP-2.0, Steam Generator Tube Leakage. The following conditions exist:

At 1000:

- DA-07, 1A 4160V BUS SUPP FROM 1A S/U XFMR, breaker tripped open.
- AFW Flow has been secured to all SGs.

• <u>SG Pressures:</u>	• <u>SG NR levels:</u>
- 1A 990 psig	- 1A 61%
- 1B 995 psig	- 1B 61%
- 1C 980 psig	- 1C 60%

At 1010:

- EEP-0.0, Reactor Trip And Safety Injection, is in progress at the step to diagnose the event.

• <u>SG Pressures:</u>	• <u>SG NR levels:</u>
- 1A 980 psig	- 1A 61%
- 1B 985 psig	- 1B 73%
- 1C 970 psig	- 1C 50%

Which one of the following correctly describes the event in progress based on the MCB indications?

- A. 1B SG is ruptured, but 1A and 1C are intact.
- B. 1A and 1B SG are ruptured, but 1C SG is intact.
- C. 1B SG is ruptured and 1C SG is faulted, but 1A SG is intact.
- D. 1A and 1B SG are ruptured and 1C SG is faulted.

33. Which one of the following adequately describes the setpoint of the steam line flow for the High Main Steam Line Flow with Low-Low T_{avg} MSIV isolation?

- A. Increases linearly from 40% to 110% steam flow as power increases from 0% to 100%.
- B. Increases linearly from 20% to 110% steam flow as power increases from 0% to 100%.
- C. Constant 20% steam flow up to 10% power; then increases linearly to 110% flow as power increases from 10% to 100%.
- D. Constant 40% steam flow up to 20% power; then increases linearly to 110% flow as power increases from 20% to 100%.

34. Unit 1 was at 26% power and 180 MWe, and the following conditions occurred:

- The reactor tripped.
- The "A" Reactor Trip Breaker failed to open.

Which one of the following correctly states the arming signal for the Steam Dumps, and the RCS temperature maintained by the Steam Dumps?

The Steam Dumps are armed due to the (1) ;

and

RCS temperature will be controlled at (2) .

- | <u> (1) </u> | <u> (2) </u> |
|------------------------|----------------|
| A. P-4 signal | 547°F |
| B. P-4 signal | 551°F |
| C. Loss of Load signal | 547°F |
| D. Loss of Load signal | 551°F |

35. The following conditions existed on Unit 1:

- This is the first plant startup after a refueling outage.
- Moderator Temperature Coefficient (MTC) is at the BOL limit allowed by the Core Operating Limits Report (COLR).
- Unit 1 was at 30% power, BOL.
- Control Rods are in Manual.

The following event occurred:

- The Main Turbine was manually tripped.

Which one of the following is the **initial** response of RCS Tavg and Reactor Power, **with no operator actions**?

Tavg (1) and Reactor Power (2) .

- | <u> (1) </u> | <u> (2) </u> |
|----------------|----------------|
| A. increases | increases |
| B. increases | decreases |
| C. decreases | increases |
| D. decreases | decreases |

36. Unit 1 was at 100% power and the following conditions exist:

- AOP-8.0, Partial Loss Of Condenser Vacuum, is in progress.
- A rapid power reduction per AOP 17.0, Rapid Load Rejection, was completed.
- Condenser Vacuum is stable.
- FE1, CONT ROD BANK POSITION LO, is in alarm.
- A normal boration is in progress per SOP-2.3, Chemical And Volume Control System Reactor Makeup Control System.

Which one of the following states:

1) whether or not SS permission is required prior to the Control Rod **insertion** during the downpower IAW NMP-OS-001, Reactivity Management Program,

and

2) is an Emergency Boration required IAW the ARP for FE1?

Control Rod Insertion

Boration

A. SS permission is **NOT** required.

Emergency boration is required.

B. SS permission is **NOT** required.

Emergency boration is **NOT** required.

C. SS permission is required.

Emergency boration is required.

D. SS permission is required.

Emergency boration is **NOT** required.

37. A Unit 1 SGFP trip has occurred from 100% power, and the following conditions exist:

- AOP-13.0, Condensate And Feedwater Malfunction, is in progress.
- The operator is at the step to "Verify automatic operation of the Feedwater Regulating Valves adequate".
- SG NR levels are as follows:
 - 1A 34% Rising
 - 1B 33% Rising
 - 1C 36% Rising

Which one of the following is the correct method of controlling the Main Feed Regulating valves (MFRVs) during this transient IAW AOP-13.0?

Place each MFRV controller in manual at (1) SG NR Level, (2) .

- | | <u> (1) </u> | <u> (2) </u> |
|----|--------------------|--|
| A. | 55% | match steam flow and feed flow, and then place the controller back in automatic. |
| B. | 55% | and then immediately place the controller back in automatic. |
| C. | 65% | match steam flow and feed flow, and then place the controller back in automatic. |
| D. | 65% | and then immediately place the controller back in automatic. |

38. ECP-0.0, Loss of All AC Power, directs the operator to:

- Dump steam from intact SGs at maximum controllable rate.

Which one of the following states the **primary reason** for dumping steam from the intact SGs at the maximum controllable rate, and states the **primary reason** for closing the Atmospheric Relief Valves (ARVs) when SG pressure is at 200 psig?

Steam is dumped from the SGs at the maximum controllable rate to (1),
and

the ARVs are closed at 200 psig SG pressure to prevent (2).

(1)

(2)

A. minimize RCS inventory loss

losing PRZR level.

B. minimize RCS inventory loss

N2 injection.

C. maximize TDAFW pump flow

losing PRZR level.

D. maximize TDAFW pump flow

N2 injection.

39. Unit 1 is ramping down for an outage at 2 MW/min. The following conditions occurred:

At 1000:

- Reactor power is 25%.
- The Reactor Makeup Control System is aligned for repetitive batch borations.
- A boration is **NOT** currently in progress.
- LK-112, LTDN TO VCT FLOW, has been adjusted to maintain 45% level in the VCT.
- LT-112B and LT-115, VCT LVL, meters both indicate 45%.

At 1001 the following occurs:

- 1A 120V Vital AC Instrumentation Panel is de-energized due to an electrical fault.

Which one of the following is the correct operator response to these conditions?

- A. Secure BOTH Reactor Makeup Water Pumps.
- B. Realign the Reactor Makeup system to AUTO.
- C. Realign LCV-115A, VCT HI LVL DIVERT VLV, to the VCT.
- D. Increase the ramp rate to control Tavg within the limits of AOP-17, Rapid Load Reduction.

40. Unit 1 was at 100%, and the following conditions occurred:

- The reactor was tripped on simultaneous loss of BOTH SGFPs.
- All AFW was subsequently lost.
- RCS Bleed and Feed is in progress in accordance with FRP-H.1, Response To Loss Of Secondary Heat Sink.
- Core Exit Thermocouples have reached 575°F and are falling.
- 1A SGFP has been started.
- SG Wide Range Levels are:
 - 1A= 8%
 - 1B= 8%
 - 1C= 10%

Which ONE of the following describes:

1) the MAXIMUM number of SGs that may be fed at the same time

and

2) the Feed Flow limit, if any, required for feeding the SGs IAW FRP-H.1?

A. 1) Feed ALL SGs at once.

2) No feed flow limit.

B. 1) Feed ALL SGs at once.

2) Limited to between 20-100 gpm.

C. 1) Feed ONE SG ONLY at a time.

2) No feed flow limit.

D. 1) Feed ONE SG ONLY at a time.

2) Limited to between 20-100 gpm.

41. Unit 1 is at 100%, and the following conditions exist:

- A Computer point for 6A FW HTR Dump valve position is in the alarm condition.
- On the IPC, the following indications are observed:
 - 6A FW Heater level indicates 12" and stable.
 - V910A, 6A FW Heater level Dump valve, symbol indicates solid red on the system mimic.
 - V909A, 6A FW Heater level Drain valve, symbol indicates solid green on the system mimic.

Which one of the following explains the given indications, and states the isolation signal which will isolate the 5A FW HTR extraction steam valve, V502A, 5A FW HTR ES ISO?

1) 6A FW HTR has a (1)

and

2) 5A FW HTR Extraction Steam will isolate on high (2).

(1)

(2)

A. tube leak

Level

B. tube leak

Pressure

C. failed open dump valve controller

Level

D. failed open dump valve controller

Pressure

42. **At 1000** the following plant conditions exist on Unit 1:

- A TECH SPEC required shutdown was in progress due to BOTH 1A and 1B SW pumps inoperable and unavailable (not running).
- 1C SW pump is aligned to B Train.

At 1005 the following events occur:

- A seismic event caused a loss of BOTH SGFPs, a leak in the A Train SW header **and** a tear in the CST at the bottom of the tank.
- CST level is at 5 ft. and decreasing.

Given the above conditions, which one of the following correctly describes the actions for establishing AFW per SOP-22.0, Auxiliary Feedwater System, for the available AFW pumps?

SOP-22.0 will direct establishing SW to the suctions of _____

- A. the 1A and 1B MDAFW pumps with SW valve alignments made from the main control room **ONLY**.
- B. the TDAFW and the 1B MDAFW pumps with SW valve alignments made from the main control room **ONLY**.
- C. ALL AFW pumps with SW valve alignments made from in the plant **AND** from the main control room.
- D. the TDAFW pump with SW valve alignments made from in the plant **AND** from the main control room, and the 1B MDAFW pump with SW valve alignments made from the main control room **ONLY**.

43. Unit 1 has had a LOSP followed by a SBLOCA, and the following conditions exist:

- The 1-2A DG is tagged out.
- The 1B DG is tripped.
- The 1C DG is supplying power to the A Train busses.
- The load on the 1C DG is 2.860 MW.

Which one of the following describes whether or not the 2000 amp hour rating on the 1C DG will be exceeded if the 1B PRZR HTR GROUP BACKUP is energized?

IF the PRZR HTR GROUP BACKUP is energized, THEN the 1C DG 2000 hour load rating (1) be exceeded,

and

energizing the 1B PRZR HTR GROUP BACKUP (2) allowed IAW EEP-1, Loss of Reactor or Secondary Coolant.

- | | <u>(1)</u> | <u>(2)</u> |
|----|-----------------|---------------|
| A. | will | is |
| B. | will | is NOT |
| C. | will NOT | is |
| D. | will NOT | is NOT |

44. Unit 1 is at 100% power with the following conditions:

- 1A Battery Charger is on service.
- EM personnel are doing preventative maintenance on the 1A battery.

The following indications and alarms are received:

- The UNIT 1 AUX BLDG DC BUS - A TRN GROUND DET white light comes on momentarily and then goes OFF.
- WC3, 1A 125V DC BUS BATT BKR 72-LA05 TRIPPED
- WC2, 1A 125V DC BUS UV OR GND alarms and clears.

Which ONE of the following describes the status of the indications on the EPB for the 1A DC BUS and the 1A and 1B Inverters?

1A DC BUS VOLTAGE reads approximately _____ (1) _____

1A and 1B INVERTER AMPERES are reading approximately _____ (2) _____

- A. (1) 0 DC VOLTS.
(2) 25 amps and being powered from the bypass source.
- B. (1) 0 DC VOLTS.
(2) 0 amps and being powered from the normal source.
- C. (1) 125 DC VOLTS.
(2) 0 amps and being powered from the bypass source.
- D. (1) 125 DC VOLTS.
(2) 25 amps and being powered from the normal source.

45. The 1B DG is being paralleled with the grid for surveillance testing, and prior to closing the 1B DG output breaker, the Synchroscope is turning **fast** in the FAST direction.

Which one of the following states:

- 1) the component with the **highest frequency** (the 1B DG output or 1G 4160V Bus), and
- 2) which **switch** must be turned to adjust frequency prior to closing the output breaker?

	<u>(1)</u>	<u>(2)</u>
A.	1G Bus Frequency	VOLTAGE ADJUST VOLTS/MVARS
B.	1G Bus Frequency	GOVERNOR MOTOR SPEED/MW
C.	1B DG Frequency	VOLTAGE ADJUST VOLTS/MVARS
D.	1B DG Frequency	GOVERNOR MOTOR SPEED/MW

46. A complete loss of instrument air has occurred on Unit 1, and the following conditions exist:

- The Reactor was tripped from 100% power.
 - The TDAFW pump auto started.
 - BOTH MDAFW pumps failed to start.
 - SG NR Levels are slowly trending up and read:
1A: 27%, 1B: 29%, 1C: 30%
- Instrument Air is expected to be lost for the next 4 hours while repairs are made.

Which one of the following describes the MAXIMUM required time to align Emergency Air compressors for the TDAFW system and the reason?

Alignment of the Emergency Air Compressors to the TDAFW components IAW SOP-62 is required within a MAXIMUM of (1)

and

is required in order to (2).

(1)

(2)

- | | |
|------------|---|
| A. 1 hour | ensure adequate heat sink |
| B. 2 hours | ensure adequate heat sink |
| C. 1 hour | prevent exceeding Tech Spec cooldown limits |
| D. 2 hours | prevent exceeding Tech Spec cooldown limits |

47. A Unit 1 #2 Waste Monitor Tank release to the environment is in progress IAW a Liquid Waste release permit and SOP-50.1, Appendix 2, Waste Monitor Tank #2 Release to the Environment.

- FH2, RMS CH FAILURE, comes into alarm.
- R-18, LIQ WASTE DISCH, is indicating normal on the Radiation Monitoring system console and on the recorder for R-18, RR0200.
- The HIGH Alarm and LOW Alarm red lights are illuminated on the R-18 drawer.
- The control power fuse holder is found to be illuminated on R-18.

What effect, if any, does this condition have on RCV-18, and the #2 WMT pump?

- A. 1) RCV-18 will **NOT** automatically close.
2) #2 WMT pump will **NOT** automatically trip.
- B. 1) RCV-18 will automatically close.
2) #2 WMT pump will **NOT** automatically trip.
- C. 1) RCV-18 will **NOT** automatically close.
2) #2 WMT pump will automatically trip.
- D. 1) RCV-18 will automatically close.
2) #2 WMT pump will automatically trip.

48. Which one of the following conditions represents a loss of containment integrity and would cause entry into Tech Spec 3.6.1, Containment?

- A. Mode 3 and one of the Personnel Airlock doors will not close.
- B. Mode 4 and Integrated Leak Rate test determines that leakage is not within limits.
- C. Mode 5 and it is discovered that the Phase 'B' isolation valve for CCW to the RCPs, will not close.
- D. Mode 6 and the Equipment Hatch is held in place by 4 bolts ONLY.

49. Unit 1 is 60% power at EOL, and the following conditions exist:

- #1 RHT is On Service and level is 10%.
- LK-112, LTDN TO VCT FLOW, has been adjusted to maintain the VCT at 40% level in AUTO.
- A manual makeup of 400 gallons at a rate of 40 gpm has been set up as the unit ramps up in power.
- #2 RHT is Off Service and level is 50%.
- #2 RHT gas space under the bladder is being educted IAW SOP-2.4, Chemical And Volume Control System Boron Recycle System, using the step entitled "#1 (#2, #3) RHT venting with RHT GAS SAMPLE PANEL."

Which one of the following describes:

1) the indication of LCV115A, VCT HI LVL DIVERT VLV, in response to the manual makeup

and

2) the indication that the educting of #2 RHT is complete or almost complete IAW SOP-2.4?

- A. 1) LCV115A will indicate RED (VCT) **AND** WHITE (HU TANK) lights LIT.
2) Gas panel annunciator #23, RHT EDUCTOR LO PRESS, comes into alarm when educting is **almost** complete.
- B. 1) LCV115A will indicate RED (VCT) **AND** WHITE (HU TANK) lights LIT.
2) PCV-251, RHT Eductor Suction Line Pressure Control valve, indication will change from red light LIT to green light LIT when educting **is** complete.
- C. 1) LCV115A will indicate RED (VCT) light LIT, WHITE (HU TANK) light **NOT** LIT.
2) Gas panel annunciator #23, RHT EDUCTOR LO PRESS, comes into alarm when educting is **almost** complete.
- D. 1) LCV115A will indicate RED (VCT) light LIT, WHITE (HU TANK) light **NOT** LIT.
2) PCV-251, RHT Eductor Suction Line Pressure Control valve, indication will change from red light LIT to green light LIT when educting **is** complete.

50. Which one of the following states **ONLY** correct purposes and/or functions of the Area Radiation Monitoring System (ARMS)?

- A. • Provide indication of Loss of RCS barrier indication for Emergency Event Classification.
 - Provide indication for when Adverse Numbers are used while performing Emergency Response Procedures.
- B. • Provide indication of Loss of RCS barrier indication for Emergency Event Classification.
 - Provide control functions to shift ventilation to recirculation in the event of high radioactivity.
- C. • Provide control functions to isolate liquid effluent processes in the event of high radioactivity.
 - Provide indication for when Adverse Numbers are needed while performing Emergency Response Procedures.
- D. • Provide control functions to isolate liquid effluent processes in the event of high radioactivity.
 - Provide control functions to shift ventilation to recirculation in the event of high radioactivity.

51. Given the following plant conditions:

- Unit 1 is in Mode 5.
- Spent Fuel is being moved in preparation for a refueling outage.
- R-25A, SFP VENT, radiation monitor loses instrument power.

Which one of the following describes:

1) the Train(s) of PRF RECIRC and EXH fans that automatically start,
and

2) whether or not manual action is required to OPEN HV-3538A, SFP to 1A PRF
SUPPLY DMPR?

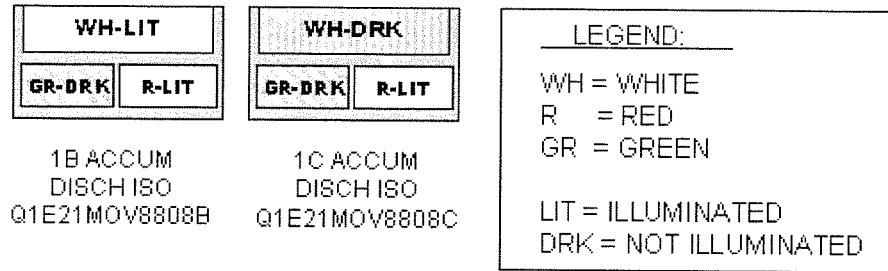
- A. 1) Only A train starts;
2) Manual action is required.
- B. 1) Only A train starts;
2) Manual action is **NOT** required.
- C. 1) Both trains start;
2) Manual action is required.
- D. 1) Both trains start;
2) Manual action is **NOT** required.

52. The following plant conditions exist on Unit 1:

- FRP-C.2, Response to Degraded Core Cooling, is in progress.
- All ECCS disconnects have been closed.
- B Train SI could **NOT** be reset, MLB 1 11-1 remains LIT.

The crew is at the step to close all SI accumulator discharge valves.

- The OATC has placed all handswitches for the SI Accumulator Discharge Isolation valves in the CLOSE position.
- The following are the indications available on the MCB:



Neither of the valves are responding to MCB switch manipulation.

Which one of the following describes the reason MOV-8808B and MOV-8808C did **NOT** close?

MOV-8808B

- A. Supply breaker has tripped open.
- B. B Train SI is NOT reset.
- C. RCS pressure is too high.
- D. Supply breaker has tripped open.

MOV-8808C

- B Train SI is NOT reset.
- Supply breaker has tripped open.
- Supply breaker has tripped open.
- RCS pressure is too high.

53. Unit 1 is at 20% power, and the following conditions occurred:

At 1000:

- Main Condenser pressure is 1.3 psia and degrading.
- AOP-8.0, Partial Loss Of Condenser Vacuum, is in progress due to an air ejector malfunction.

At 1010:

- Main Condenser vacuum has degraded to 12 psia.
- AOP-13.0, Condensate And Feedwater Malfunction, has been entered.

Which one of the following describes the Circulating Water (CW) outlet temperature at 1010 as compared to earlier, and the action(s) required by AOP-13.0 ?

At 1010 CW outlet temperature is (1) than **at 1000**,

and

AOP-13.0 requires (2) .

 (1)

 (2)

- | | |
|-----------|------------------------------------|
| A. higher | tripping the reactor |
| B. lower | reducing power to approximately 2% |
| C. higher | reducing power to approximately 2% |
| D. lower | tripping the reactor |

54. A Safety Injection and loss of B train Start Up transformer occurred on Unit 2.

Which one of the following is the position of the Turbine Building Service Water Supply Isolation Valves?

Valve nomenclature is listed below:

SW TO TURB BLDG ISO B TRN V514

SW TO TURB BLDG ISO A TRN V515

SW TO TURB BLDG ISO A TRN V516

SW TO TURB BLDG ISO B TRN V517

V515/V517

V514/V516

- | | | |
|----|-----------|-----------|
| A. | Throttled | Throttled |
| B. | Closed | Throttled |
| C. | Throttled | Closed |
| D. | Closed | Closed |

55. The following plant conditions exist on Unit 1:

- 100% power.
- All systems are aligned normally.
- Generator reactive load is currently at "0" MVARs.
- ACC has notified the plant that system voltage problems require UNIT 1 to establish maximum allowable incoming reactive load (MVARs in).

Which one of the following:

1) identifies the administrative limit on incoming reactive load (MVARs in) IAW UOP-3.1, Power Operation,

and

2) the proper switch which will be used to establish maximum allowable incoming reactive load?

<u>(1)</u>	<u>(2)</u>
A. -200 MVARs	Manual Voltage Adjust Switch
B. - 200 MVARs	Auto Voltage Adjust Switch
C. -300 MVARs	Manual Voltage Adjust Switch
D. -300 MVARs	Auto Voltage Adjust Switch

56. Which one of the following correctly states the power supplies to the 1A and 1B Emergency Air Compressors?

- A. 1A and 1B 600V MCC
- B. 1A and 1B 600V LCC
- C. 1D and 1E 600V LCC
- D. 1U and 1V 600V MCC

57. The following plant conditions exist on Unit 1:

- A LOCA has occurred.
- Containment Pressure is 30 psig and decreasing.
- All required actuations have occurred.

Which one of the following describes the **MINIMUM conditions** if any, **AND** actions required to reset '**B**' train PHASE B CTMT ISO (MLB-3 6-1)?

- A. 1) Containment Pressure must be lowered to less than the HI-3 setpoint prior to reset.
- 2) BOTH Train A and B CS RESET pushbuttons, and BOTH Train A and B PHASE B CTMT ISO RESET pushbuttons must be depressed.
- B. 1) Containment Pressure must be lowered to less than the HI-3 setpoint prior to reset.
- 2) The B Train PHASE B CTMT ISO RESET pushbutton ONLY must be depressed.
- C. 1) Phase B can be reset regardless of Containment Pressure.
- 2) The B Train PHASE B CTMT ISO RESET pushbutton ONLY must be depressed.
- D. 1) Phase B can be reset regardless of Containment Pressure.
- 2) BOTH Train A and B CS RESET pushbuttons, and BOTH Train A and B PHASE B CTMT ISO RESET pushbuttons must be depressed.

58. Refueling on Unit 2 is in progress, and the following conditions exist:

- The Containment Equipment Hatch is open and hoses and electrical cables are routed through the Hatch.
- Both Main Personnel Airlock doors are open.
- The Inner Airlock door is inoperable and cannot be closed.
- CTMT Main Purge is in operation.
- R-24A and R-24B are discovered to be inoperable.

Which one of the following describes whether or not Fuel movement may continue in Containment, and the reason?

- A. CORE ALTERATIONS must be stopped immediately, because R-24A and R-24B are inoperable.
- B. CORE ALTERATIONS must be stopped immediately, because the Inner Airlock door cannot be closed.
- C. CORE ALTERATIONS must be stopped immediately, because the Containment Equipment Hatch is open.
- D. CORE ALTERATIONS may continue in the current condition, because all penetrations are capable of being isolated with manual actions.

59. Which one of the following demonstrates **UNACCEPTABLE** communication IAW ACP-1.0, Plant Communications?

A. During a ramp per UOP-3.1, Power Operation;

the SS speaking to the UO: "Jim, raise turbine load by 10 megawatts at 1 megawatt per minute."

UO: "Raise turbine load by 10 megawatts at 1 megawatt per minute".

SS: "That's correct."

B. While swapping on service CCW heat exchangers per SOP-23.0, Component Cooling Water System;

the UO speaking to the Rover on the phone: "Check one bravo CCW heat exchanger outlet isolation valve, Q1P17V008 Bravo, closed."

Rover: "Check one bravo CCW heat exchanger outlet isolation valve, Q1P17V008 Bravo, closed."

UO: "That's correct."

C. In preparation for a Waste Gas Release per SOP-51.1, Waste Gas System Gas Decay Tank Release;

the Shift Radio Chemist speaking to the Chemistry Technician: "Joe, Sample Unit 1 Waste Gas Decay Tank #2 for release."

Chemistry Technician: "Sample Unit 1 Waste Gas Decay Tank #2."

Shift Radio Chemist: "Yes, sample #2 Waste Gas Decay Tank on Unit 1."

D. While performing EEP-0.0, Reactor Trip and Safety Injection;

the SS speaking to the OATC: "Check Containment Pressure has remained less than 27 psig."

OATC: "Yes, Containment Pressure is 1.6 psig."

60. The following plant conditions exist on Unit 1:

AT 1000:

- N-41, N-42, N-43, and N-44, PR Nuclear Power, indicate 100% power.
- Main Generator Load is 901 MW.
- All SG steam flows are 4.1×10^6 lbs/hr.

AT 1010:

The crew identifies PK-3371A, 1A SG Atmospheric Relief Valve Controller, failed to 100% demand.

- The UO places PK-3371A in manual and lowers the demand to 0%.
- The crew suspects the Atmospheric Relief Valve has not closed.

Which one of the following sets of stable plant parameters indicates that PCV-3371A has **remained OPEN**?

		Stm Flow ($\times 10^6$ lbs/hr)		
	<u>MW</u>	<u>1A SG</u> <u>FI-474</u>	<u>1B SG</u> <u>FI-484</u>	<u>1C SG</u> <u>FI-494</u>
A.	840 MW	4.970	4.100	4.100
B.	840 MW	4.404	4.398	4.398
C.	880 MW	4.500	4.100	4.100
D.	880 MW	4.254	4.248	4.248

61. Which one of the following lists **ONLY** those personnel in which BOTH are required to request permission to enter the Control Room **At-the-Controls Area** from the OATC IAW NMP-OS-007-001, Conduct of Operations Standards and Expectations?

- A. NRC Inspectors, Plant Manager
- B. Operations Superintendents, Site VP
- C. Operations Manager, Chemistry Foreman
- D. Reactor Engineer, Health Physics Foreman

62. Both Units are operating at 22% power with the following conditions:

- Both units 4160V Busses A, B and C are powered from their respective Startup Transformers.

AT 1000 the following occurs:

Due to Severe Weather, the 1B Startup Transformer and 2A Startup Transformer became de-energized.

Which one of the following states **ALL** of the Reactor Coolant Pumps (RCPs) which will still be running after the event?

<u>Unit 1</u>	<u>Unit 2</u>
A. 1A RCP	2A RCP
B. 1A RCP	2B and 2C RCPs
C. 1B and 1C RCPs	2A RCP
D. 1B and 1C RCPs	2B and 2C RCPs

63. Unit 1 is in Mode 6. Fuel Movement inside containment is in progress, and the following conditions occurred:

At 1000:

- The 1B DG is tagged out for Maintenance.
- The 1A RHR pump is in operation.
- The 1B RHR pump is in standby.

At 1005:

- DG15, 1B SU XFMR to 1G 4160V BUS, tripped open.

Which one of the following correctly states whether or not the Tech Specs listed below are met?

- 3.8.2 AC Sources—Shutdown
- 3.9.4 Residual Heat Removal (RHR) and Coolant Circulation—High Water Level

	<u>TS 3.8.2</u>	<u>TS 3.9.4</u>
A.	is met	is met
B.	is met	is NOT met
C.	is NOT met	is met
D.	is NOT met	is NOT met

64. Unit 1 is at 100% power, and the following conditions occurred:

- Containment mini-purge supply and exhaust fans are running.

R-11, CTMT ATMOS, has come into alarm. It is reading 8000 cpm.

The following radiation monitors are trending up:

- R-12, CTMT GAS
- R-2, CTMT 155 FT
- R-7, SEAL TABLE

Which one of the following are the actions that the OATC is required to take for this condition IAW annunciator response procedure FH1, RMS HI-RAD?

- A. • Check pressurizer level and VCT level stable.
- Secure containment mini-purge fans.
- B. • Ensure ALL containment mini-purge dampers have automatically closed.
- Secure containment mini-purge fans.
- C. • Check pressurizer level and VCT level stable.
- Verify ARDA has auto started.
- D. • Ensure ALL containment mini-purge dampers have automatically closed.
- Verify ARDA has auto started.

65. A Plant Operator is assigned to use a portable RAM 100 frisker during an emergency entry.

Which one of the following describes the:

1) radiation that the frisker detects

and

2) the required checks prior to use IAW RCP-208, Operation and Calibration of MGP Instruments RAM 100 Count Rate Meter?

A. 1) Beta-gamma ONLY.

2) Ensure the daily response check is current and conduct a battery check.

B. 1) Beta ONLY.

2) Ensure the instrument responds properly to a known reference source and calibrate the instrument.

C. 1) Beta-gamma ONLY.

2) Ensure the instrument responds properly to a known reference source and calibrate the instrument.

D. 1) Beta ONLY.

2) Ensure the daily response check is current and conduct a battery check.

66. The Unit 1 Radside System Operator is required to enter the RCS Filter cubicle to operate a valve with a broken reach rod and hang a clearance. The Radside System Operator's year-to-date TEDE is 1.5 Rem.

- The RCS Filter cubicle dose rate is 1 R/hr.
- It will take 40 minutes to perform this job.

Which one of the following states the 10CFR20 TEDE radiation exposure limits, and whether or not the worker will exceed the FNP Admin Limits per FNP-M-001, Health Physics Manual?

The 10CFR20 TEDE exposure limit is (1) Rem/year.

This worker (2) exceed the FNP Admin Limits in FNP-M-001.

	<u>(1)</u>	<u>(2)</u>
A.	10 Rem	will
B.	10 Rem	will NOT
C.	5 Rem	will
D.	5 Rem	will NOT

67. Unit 1 has just experienced a Reactor Trip, and the following conditions exist:

- The Operator at the Controls (OATC) and the Unit Operator (UO) are in the Control Room.
- Performance of EEP-0.0, Reactor Trip or Safety Injection, Immediate Operator Actions (IOAs) from memory is in progress.

Which one of the following states the roles assigned to each Plant Operator **during** the performance of IOAs of EEP-0.0 IAW SOP-0.8, Emergency Response Procedure User's Guide?

The OATC is required to perform IOAs and while the IOAs are being performed is required to (1) any ESF components if auto actuations failed to occur as designed, and

the UO will (2)

- A. (1) manually align
(2) perform IOAs.
- B. (1) manually align
(2) **NOT** perform IOAs, but will ensure the OATC performs the IOAs correctly.
- C. (1) complete the IOAs of EEP-0.0 before manually aligning
(2) perform IOAs.
- D. (1) complete the IOAs of EEP-0.0 before manually aligning
(2) **NOT** perform IOAs, but will ensure the OATC performs the IOAs correctly.

68. Unit 1 was at 100% power when a Large Break LOCA and a subsequent LOSP occurred. The following conditions exist:

- The crew is performing the actions of ECP-0.0, Loss of ALL AC Power.
- Attempts to restore power to any 4160V bus from any source per the step, "Restoration of power to any emergency bus", have all been **unsuccessful**.
- ALL Core Exit Thermocouples (CETCs) read 725°F and are increasing.

Which one of the following is the required procedural flowpath?

- A. Continue in ECP-0.0 until power is restored to at least one emergency bus.
- B. Continue in ECP-0.0 until instructed to monitor CSF status trees.
- C. Immediately transition to FRP-C.2, Response to Degraded Core Cooling, from any step of ECP-0.0.
- D. Immediately transition to FRP-C.1, Response to Inadequate Core Cooling, from any step of ECP-0.0.

69. An inadvertent Safety injection has occurred on Unit 1. ESP-1.1, SI Termination, was in progress when the following conditions occurred:

- MLB-1 1-1 and 11-1 lights are NOT LIT.
- Pressurizer level is dropping rapidly.
- SG narrow range water levels are:
 - 1A SG 42% ↑.
 - 1B SG 30% ↓.
 - 1C SG 31% ↓.
- All SG pressures are decreasing rapidly.
- All Main Steam Isolation Valves (MSIVs) are open.
- Cmtt pressure is 14 psig and increasing.

Which one of the following states:

1) the allowable actions to be taken per SOP-0.8, Emergency Response Procedure User's Guide,

and

2) the procedure to implement **IF** the crew is not sure of the procedural transition?

- A. 1) Close the MSIVs;
2) Enter ESP-0.0, Rediagnosis.
- B. 1) Isolate all AFW to 1A SG;
2) Enter ESP-0.0, Rediagnosis.
- C. 1) Close the MSIVs;
2) Re-enter EEP-0, Rx Trip and Safety Injection.
- D. 1) Isolate all AFW to 1A SG;
2) Re-enter EEP-0, Rx Trip and Safety Injection.

70. The Unit 1 crew has transitioned to ECP-1.2, LOCA Outside Containment.

Which one of the following correctly states the Cold Leg Injection path which is isolated, and the parameter used to determine if the break is isolated IAW ECP-1.2?

The (1) Cold Leg Injection path is isolated,
and

RCS (2) rising is used to determine if the break is isolated IAW ECP-1.2.

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|------------|
| A. | RHR | Pressure |
| B. | RHR | Subcooling |
| C. | HHSI | Pressure |
| D. | HHSI | Subcooling |

71. Given the following plant conditions for Unit 1:

- A Train is On Service.
- The Operators have implemented FRP-H.1, Response to Loss of Secondary Heat Sink.
- RCS feed and bleed criteria was met and a manual Safety Injection was initiated IAW FRP-H.1.
- 1C Charging pump is tripped.
- PRZR PORV, PCV-445A, will **NOT** open.

Which one of the following describes the **MINIMUM** action(s) required to provide adequate core cooling?

- A. Open one PORV.
- B. Open four Reactor Vessel Head vents.
- C. Open one PORV AND Open four Reactor Vessel Head vents.
- D. Open one PORV AND Open four Reactor Vessel Head vents, AND place 1B Charging pump on B train and start 1B Charging pump.

72. Given the following plant conditions for Unit 1:

- A failure has occurred on TE-412, Loop A T_{AVG} , resulting in a constant output equivalent to 561°F.
- A failure has occurred on TE-422, Loop B T_{AVG} , resulting in a constant output equivalent to 570°F.
- The Reactor is manually tripped.

Which one of the following states the protective feature(s) that will prevent a Pressurized Thermal Shock (PTS) condition from developing, **with no operator actions**?

- A. P-4, Reactor Trip Interlock.
- B. Main Steam Line Isolation on High Flow **AND** Main Steam Line Isolation on Low Pressure.
- C. Main Steam Line Isolation on Low Pressure (Main Steam Line Isolation on High Flow will **NOT** prevent a PTS condition).
- D. Main Steam Line Isolation on High Flow (Main Steam Line Isolation on Low Pressure will **NOT** prevent a PTS condition).

73. A Dual unit LOSP with a **Unit 2** Large Break LOCA has occurred and the following conditions occurred:

- CTMT pressure is 6 psig.
- EEP-1.0, Loss of Reactor or Secondary Coolant, is in progress.

At 1000: WA2, 1-2A DG GEN FAULT TRIP, comes into alarm.

At 1020: the following alarms **have just come in:**

- CF3, 2A OR 2B RHR PUMP OVERLOAD TRIP
- CH2, RWST LVL A TRN LO
- CH3, RWST LVL B TRN LO

Which one of the following is:

1) the correct status of Unit 2 emergency recirculation capability,
and

2) the action(s) that the applicable procedure(s) direct?

- A. 1) One train ONLY of emergency recirc capability has been lost.
2) Transfer to Cold Leg recirc **AND** Containment Spray recirc at this time.
- B. 1) One train ONLY of emergency recirc capability has been lost.
2) Transfer to Cold Leg recirc, but do **NOT** transfer to Containment Spray recirc at this time.
- C. 1) Both trains of emergency recirc capability have been lost.
2) Verify both Containment spray pumps secured, **AND** minimize HHSI flow to the minimum required to remove decay heat.
- D. 1) Both trains of emergency recirc capability have been lost.
2) Verify both Containment spray pumps **AND** HHSI pumps are secured while attempting to restore at least one train of emergency recirc.

74. Unit 2 is in Mode 3, preparing to open the MSIVs after warm-up of the Main Steam lines is complete using FNP-2-SOP-17.0, Main and Reheat Steam.

- RCS Temp is 547°F.
- All required manual MSIV Bypass Warmup and Air Operated MSIV Bypass valves are open IAW FNP-2-SOP-17.0.
- Steam header pressure and each SG pressures are approximately equal.

The UO opens the MSIVs, and immediately after opening all MSIVs:

- A large Steam Break occurs in the Turbine Building.
- The MSIVs would NOT close EITHER automatically OR when the MCB handswitches were placed in the CLOSE position.

Which one of the following describes the number of **manual** MSIV Bypass Warmup valve(s) installed, and the final position of the Air Operated MSIV Bypass Valves?

(1) **manual** Main Steam Isolation Bypass Warmup Valve(s) is(are) installed to warm up main steam lines per FNP-2-SOP-17.0,

and

the final positions of the Air Operated MSIV Bypass Valves is (2).

	<u>(1)</u>	<u>(2)</u>
A.	3	open
B.	3	closed
C.	1	open
D.	1	closed

75. A Large Break LOCA has occurred on Unit 2, and the following conditions exist:

- R-27A and B, CTMT HI RANGE, indicates 3 Rem/hr.
- RE-11, CTMT PART, and RE-12, CTMT GAS, on the Integrated Plant Computer (IPC) shows an initial upscale followed by a slow trend towards background levels.

Which ONE of the following describes the reason for the observed trend on RE-11 and RE-12 towards a background count rate?

RE-11 and RE-12 are isolated from containment **directly** from a _____ signal.

- A. Phase A
- B. Phase B
- C. Safety Injection
- D. Containment Ventilation Isolation

76. Which one of the following states the RHR flow requirement to be considered OPERABLE in accordance with TS 3.9.5, Residual heat Removal (RHR) and Coolant Circulation -- Low Water Level?

RHR pump flow must be a **minimum** of _____ gpm to be OPERABLE.

- A. 3300
- B. 3000
- C. 2750
- D. 1750

77. Unit 1 is in Mode 3, and the following conditions exist:

At 10:00:

- The shutdown banks are withdrawn.
- A Cooldown per Technical Specification 3.4.10, Pressurizer Safety Valves, is in progress due to an inoperable PRZR code safety valve.
- T_{cold} is 530°F.

At 10:10, A complete Loss of Off-Site Power occurs with the following conditions:

- All emergency equipment operates normally.
- ACC reports that off-site power will be restored in 18 hrs.

Which one of the following describes the required action, if any, to open the Rx Trip Breakers and the procedure transition from ESP-0.1, Reactor Trip Response, after the plant is stabilized?

Manual action (1) required to open the Rx Trip Breakers.

After the plant is stabilized the crew will transition to (2) from ESP-0.1, Reactor Trip Response.

- | | <u> (1) </u> | <u> (2) </u> |
|----|----------------|---|
| A. | IS | ESP-0.2, Natural Circulation Cooldown to Prevent Reactor Vessel Head Steam Voiding |
| B. | IS | ESP-0.3, Natural Circulation Cooldown with Allowance for Reactor Vessel Head Steam Voiding (with RVLIS) |
| C. | IS NOT | ESP-0.2, Natural Circulation Cooldown to Prevent Reactor Vessel Head Steam Voiding |
| D. | IS NOT | ESP-0.3, Natural Circulation Cooldown with Allowance for Reactor Vessel Head Steam Voiding (with RVLIS) |

78. Unit 1 is at 100% with the following conditions:

- Pressurizer pressure control is in AUTO.
- PT-445, PRZR PRESS, pressure transmitter fails HIGH.

Which one of the following describes:

- 1) the PRT pressure following a PT-445 failure **with no operator actions for five (5) minutes**,

AND

- 2) the basis for the limit of T.S. 3.4.13, RCS Operational Leakage, if leakage continues into the PRT past the PORV and its block valve after the valves are closed?

- A. 1) The PRT pressure will remain below rupture disc setpoint.
- 2) The leakage limit is a reasonable minimum detectable amount that the leak detection processes can detect within a reasonable period of time.
- B. 1) The PRT pressure will remain below rupture disc setpoint.
- 2) The leakage limit is well within the capability of the makeup system and does not interfere with the identification of other leakage.
- C. 1) The PRT will pressurize until the rupture disc ruptures.
- 2) The leakage limit is well within the capability of the makeup system and does not interfere with the identification of other leakage.
- D. 1) The PRT will pressurize until the rupture disc ruptures.
- 2) The leakage limit is a reasonable minimum detectable amount that the leak detection processes can detect within a reasonable period of time.

79. An automatic SI from 100% has occurred on Unit 1 due to a pressurizer safety valve failed open and the following conditions exist:

- RCPs have been secured.
- Phase B has actuated.
- The 1B CS Spray Pump tripped.
- The 1C CTMT Cooler Fan will not start.

AT 1000, plant conditions are as follows:

- RCS pressure 1335 psig and dropping ↓
- Pressurizer level 100%
- All CETCs indicate 550°F and stable
- Lowest T_{cold} 405°F and stable
- All three SG levels 48% narrow range and stable
- RVLIS 72% Upper Plenum and dropping ↓
- R-2 0.8 R/hr and stable
- R-27A 1 R/hr and stable
- Containment Hydrogen 0%
- Containment Pressure 4.8 psig and dropping ↓
- Containment Sump Level 2.7 ft and rising ↑
- RCS Activity < Tech Spec limit

AT 1050, the crew has since aligned instrument air to containment and the following parameters are reported:

- All CETCs indicate 743°F and rising ↑
- Containment Pressure 1.9 psig and dropping ↓

Considering **ONLY** the Fission Product Barriers, which one of the following identifies the Emergency Classification at 1000 and later at 1050?

(ED Judgement is NOT to be used as criteria for the declaration)

REFERENCE PROVIDED

1000

1050

- | | |
|------------------------------|---------------------------|
| A. Alert (FA1) | Site Area Emergency (FS1) |
| B. Alert (FA1) | General Emergency (FG1) |
| C. Site Area Emergency (FS1) | Site Area Emergency (FS1) |
| D. Site Area Emergency (FS1) | General Emergency (FG1) |

80. The following plant conditions exist:

- Unit 1 is performing the first reactor startup following a refueling outage.
- The reactor has been critical for <100 hrs.
- UOP-1.2, Startup of Unit From Hot Standby to Minimum Load, is in progress.
- All Control Bank D (CB D) rod heights indicated by DRPI and group step counters are at 208 steps.
- Reactor power is 20%.

A Main Generator trip occurred with rod control in automatic. During that transient, a failure occurred on CB D rod H-2 CRDM such that its lift coil will not energize. After the plant is stabilized, the following conditions exist:

- Rod H-2 is 14 steps above CB D step counters.
- The cause for the lift coil malfunction has **NOT** been identified.

Which one of the following states if TS 3.1.4, Rod Group Alignment Limits, are met and the required actions per AOP-19.0, Malfunction of Rod Control System?

The Rod Group Alignment Limits of TS 3.1.4 (1) met.

AOP-19.0 will direct the operator to (2).

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|---|
| A. | are | Perform rod realignment using AOP-19.0, Attachment 2, Misaligned Rod Recovery or Maintenance Testing. |
| B. | are NOT | Perform rod realignment using AOP-19.0, Attachment 2, Misaligned Rod Recovery or Maintenance Testing. |
| C. | are | Immediately commence a shutdown using UOP-2.1, Shutdown of Unit From Minimum Load to Hot Standby. |
| D. | are NOT | Immediately commence a shutdown using UOP-2.1, Shutdown of Unit From Minimum Load to Hot Standby. |

81. Unit 1 startup is in progress using UOP-1.2, Startup of Unit from Hot Standby to Minimum Load. Reactor power is being maintained 2-4%, when the following occurs:

- N-44, Power Range NI, fails high.

Which one of the following describes the procedure containing the required response to the failure, and the ability to enter Mode 1 upon completing the AOP actions, IAW Tech Spec 3.3.1, Reactor Trip System Instrumentation, Conditions D and E and Tech Spec 3.0.4?

REFERENCE PROVIDED

(1) contains all of the required actions; after completing the AOP actions.

Mode 1 entry (2) permitted by Tech Specs.

- A. 1) AOP-100, Instrumentation Malfunction.
2) IS
- B. 1) AOP-100, Instrumentation Malfunction.
2) IS NOT
- C. 1) AOP-19, Malfunction of Rod Control System.
2) IS
- D. 1) AOP-19, Malfunction of Rod Control System.
2) IS NOT

82. UNIT 1 is in Mode 1, when the following conditions and sequence of events occur:

CTMT CLR FANS SEL switches are positioned as follows:

- A Train selected to 1A
- B Train selected to 1D

1300 Aug 06: Containment Spray Pump 1A declared INOPERABLE.

1900 Aug 08: 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 through either cooler being 500 gpm.
- BA3, 1C CTMT CLR FAN FAULT, came into alarm due to 1C CTMT CLR Fan Slow Speed breaker tripping open when started.

0327 Aug 09: 1A Containment Spray Pump was returned to OPERABLE status.

Which one of the following states the **latest** time and date that Mode 3 must be (have been) entered without violating Tech Spec 3.6.6, Containment Spray and Cooling Systems?

Mode 3 must be (have been) achieved no later than (date) at (time) .

REFERENCE PROVIDED

	<u>DATE</u>	<u>TIME</u>
A.	Aug 09	0200
B.	Aug 12	0100
C.	Aug 16	0100
D.	Aug 16	1900

83. The following plant conditions exist on Unit 2:

AT 1000:

- 100% power.
- A Train is on service.
- 2A CCW pump is tagged out to investigate a pump trip which occurred 3 hours earlier.
- 2A Charging pump is in service.

AT 1010, the following event occurs:

- EA3, CHG PUMP LUBE OIL TEMP HI, comes into alarm.
- The Radside systems operator reports the 2A charging pump local temperature is 156°F and rising.

Which one of the following states the **required actions** per EA3, CHG PUMP LUBE OIL TEMP HI, and describes **IF** T.S. 3.0.3 entry is required per Tech Spec 3.5.2, ECCS-Operating?

- A. • Immediately stop the 2A charging pump, then start 2B charging pump.
 - Entry into T.S. 3.0.3 IS required.
- B. • Immediately stop the 2A charging pump, then start 2B charging pump.
 - Entry into T.S. 3.0.3 is **NOT** required.
- C. • Start 2B charging pump, then stop the 2A charging pump.
 - Entry into T.S. 3.0.3 IS required.
- D. • Start 2B charging pump, then stop the 2A charging pump.
 - Entry into T.S. 3.0.3 is **NOT** required.

84. Given the following conditions on Unit 1:

AT 1000:

- RCS subcooling is -3 °F.
- RVLIS lights are ALL red.
- Containment pressure reached 29 psig and is decreasing.
- ESP-1.3, Transfer to Cold Leg Recirculation, is in progress.
- Both A and B ECCS Trains have just been aligned for cold leg recirculation.
- RWST level is 4.3 feet.
- 1A Containment Spray pump discharge flow drops to 900 gpm, jumps to 1300 gpm, and then begins falling again.

AT 1005 annunciator CA1, 1A CS PUMP OVERLOAD TRIP, comes into alarm.

Which one of the following describes the potential impact, if any, on the Containment Spray **design function**; and the action required by procedure for this failure?

- A. • Containment Iodine may exceed design limits.
 - Go to ECP-1.3, Loss of Emergency Coolant Recirculation Caused by Sump Blockage.
- B. • Containment Iodine will **NOT** exceed design limits.
 - Go to ECP-1.3, Loss of Emergency Coolant Recirculation Caused by Sump Blockage.
- C. • Containment Iodine may exceed design limits.
 - Continue in ESP-1.3, Transfer to Cold Leg Recirculation.
- D. • Containment Iodine will **NOT** exceed design limits.
 - Continue in ESP-1.3, Transfer to Cold Leg Recirculation.

85. Unit 1 is at 100% power with all control systems in automatic and the following conditions exist:

A pressurizer pressure transmitter fails resulting in:

- RCS pressure is 2150 psig and lowering ↓.
- Both Spray valves are CLOSED.
- PCV-444B, PRZR PORV is CLOSED.
- PCV-445A, PRZR PORV is OPEN.
- All heaters are energized.

The crew successfully completes the Immediate Operator Actions required for the instrument failure and plant conditions are stabilized with the unit remaining at power.

Which one of the following states which pressure transmitter that has failed and the OPERABILITY status of PCV-445A per T.S. 3.4.11, Pressurizer Power Operated Relief Valves (PORVs)?

(1) has failed high. PCV-445A (2) OPERABLE.

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|------------|
| A. | PT-444 | IS |
| B. | PT-444 | IS NOT |
| C. | PT-445 | IS |
| D. | PT-445 | IS NOT |

86. Unit 1 is in Mode 5, preparing to enter Mode 4 with the following plant conditions:

- STP-16.14, ECCS Recirculation Fluid pH Control System Verification, has just been completed with the following results:
 - **1A Basket** is reported to have broken mesh, the trisodium phosphate is spilling out, and level is between the MIN and MAX level mark.
 - **1B Basket** is reported to have level equal to the MAX level mark.
 - **1C Basket** level is equal to the MIN level mark and the TSP is lumped/caked up.

Which one of the following states the operability status of the ECCS Recirculation Fluid pH Control System per TS 3.5.6, ECCS Recirculation Fluid pH Control System, and the reason?

The ECCS Recirculation Fluid pH Control System is (1) , because the (2)

 (1)

 (2)

- | | |
|---------------|---|
| A. Operable | volume is sufficient in all three baskets. |
| B. Operable | volume and integrity is sufficient in 2 of 3 baskets. |
| C. Inoperable | integrity of 1A basket is unacceptable and the lumped/caked TSP in the 1C basket is unacceptable. |
| D. Inoperable | integrity of ONLY 1A basket is unacceptable. |

87. Unit 1 is at 100% power when an air line break results in a High Penetration Room Pressure Isolation signal actuation and the following conditions:

- KD2, INSTRUMENT AIR PRESSURE LO, is in alarm.
- RCP Seal injection flow to RCPs are as follows:
 - FI-130A, 1A RCP = 13.6 gpm
 - FI-127A, 1B RCP = 13.5 gpm
 - FI-124A, 1C RCP = 11.3 gpm
- Avg. PZR pressure is 2235 psig and rising.
- PI-121, CHG HDR PRESS = 2420 psig.

After repairs, the seal injection parameters are stabilized as follows:

- HIK-186, Seal WTR Injection, is set to 25%.
- RCP Seal injection flow to RCPs are as follows:
 - FI-130A, 1A RCP = 8.5 gpm
 - FI-127A, 1B RCP = 8.5 gpm
 - FI-124A, 1C RCP = 8.3 gpm
- Avg. PZR pressure is 2235 psig and stable.
- PI-121, CHG HDR PRESS = 2420 psig.

Given the above conditions, which one of the following states the requirement to adjust seal injection flow, if any, AND the basis for maintaining Seal Injection flow within the limits T.S. 3.5.5, Seal Injection Flow Limits?

Adjustment of the individual RCP seal injection throttle valves (1) required;

The seal injection flow **HIGH** limit of T.S. 3.5.5 is to ensure (2)

REFERENCE PROVIDED

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|---|
| A. | IS | adequate ECCS flow is available following a LOCA. |
| B. | IS | RCP seal integrity is maintained. |
| C. | IS NOT | RCP seal integrity is maintained. |
| D. | IS NOT | adequate ECCS flow is available following a LOCA. |

88. Given the following:

- Unit 1 is at 100% power with B Train on service.
- 1E Service Water pump tripped.
- AE4, SW PUMP TRIPPED, is in alarm.

Which one of the following procedures, upon completion, is the **earliest** that B Train Service Water can be declared OPERABLE?

- A. ARP-1.1, AE4, SW Pump Tripped
- B. AOP-10.0, Loss of Service Water
- C. SOP-24.0, Service Water System
- D. SOP-36.6, Circuit Breaker Racking Procedure

89. The following plant conditions exist on Unit 1:

- The Reactor was manually tripped from 100% power due to a complete Loss of Instrument Air.
- ESP-0.1, Reactor Trip Response, is in progress.
- The crew has identified an unisolable rupture downstream of the Instrument Air Dryers.
- PZR Level is 64% and increasing.

Which one of the following describes the appropriate procedural strategy of controlling PZR level for the given conditions, and the operability per Tech Spec 3.4.9, Pressurizer?

Isolate charging flow and (1); The Pressurizer is (2)

- A. 1) maintain T_{avg} stable as directed by AOP-6, Loss of Instrument Air, until repairs are made.
2) inoperable.
- B. 1) cool down as required to restore pressurizer level as directed by AOP-16, CVCS Malfunction.
2) inoperable.
- C. 1) maintain T_{avg} stable as directed by AOP-6, Loss of Instrument Air, until repairs are made.
2) operable.
- D. 1) cool down as required to restore pressurizer level as directed by AOP-16, CVCS Malfunction.
2) operable.

90. The following plant conditions exist:

- The Motor Driven Fire pump (MDFP) was started remotely per SOP-61.0, Fire Protection- Pump House and Yard Main, for annual valve cycle testing in the Unit 2 Auxiliary Building.
- MH3, FIRE PROT SYS TRBL, is in alarm due to the MDFP supply breaker tripping open.

Which one of the following states the status of the amber light on the MDFP, N1P43P003, MCB handswitch, AND the minimum Fire Pump requirements for operability of the Fire Suppression Water System?

The MDFP control switch amber light will be (1)

The Fire Suppression Water System is considered operable when a minimum of (2) Fire Pumps are operable.

- A. 1) LIT.
2) Two
- B. 1) LIT.
2) Three
- C. 1) **NOT** Lit
2) Two
- D. 1) **NOT** Lit.
2) Three

91. Unit 1 is in Mode 4.

At 0500 LCV-115B, RWST TO CHG PUMP, was manually checked closed using the local handwheel to isolate the 1A Chg Pump on an outage tagout.

At 1900 the work is complete and the following conditions exist:

- The 1A Chg Pump has been filled, vented, and tagged in.
- The tagout has restored power to LCV-115B and the GREEN valve position light is lit.

Which one of the following correctly states the OPERABILITY of LCV-115B, and the requirements, if any, for returning LCV-115B to service as stated in SOP-0.0, General Instructions to Operations Personnel?

A. • LCV-115B is **NOT** OPERABLE.

- The valve should be electrically stroked one full cycle to demonstrate operability prior to return to service.

B. • LCV-115B is **NOT** OPERABLE.

- The valve should be time stroked in the open direction to demonstrate operability prior to return to service.

C. • LCV-115B is OPERABLE.

- No additional testing is required.

D. • LCV-115B is OPERABLE.

- The valve should be electrically stroked one full cycle to clear the Administrative LCO on the MOV.

92. Unit 1 is at 100% power, and the following conditions exist:

- Chemistry discovers and reports that Surveillance Requirement 3.5.1.4, the safety injection accumulator boron concentration verification, which is required at a frequency of 31 days, has been missed for the 1C SI ACCUM.
- The last 1C SI ACCUM boron sample result was 2260 ppm 45 days ago.
- The 1C Accumulator level has risen 3% since the last sample but no fill evolution has occurred.

Which one of the following states whether or not the 1C Accumulator is OPERABLE and the reason?

The 1C Accumulator is (1) because (2)

(1)

(2)

- | | | |
|----|------------|---|
| A. | OPERABLE | the delay period of SR 3.0.3 may be applied for up to 31 days. |
| B. | OPERABLE | the delay period of SR 3.0.3 may be applied for only the next 24 hours. |
| C. | INOPERABLE | the surveillance frequency has been missed. |
| D. | INOPERABLE | the boron concentration is unknown. |

93. The following plant conditions exist on Unit 1:

- A gaseous waste release is in progress IAW a gas waste permit and SOP-51.1, Waste Gas System Gas Decay Tank Release.
- The power supply to R-14, Plant Vent Gas Monitor, fails.
- The following alarms have come in:
 - FH1, RMS HI-RAD.
 - FH2, RMS CH FAILURE.

Which one of the following is the required action, and is a complete list of personnel required to be notified per FH1, FH2, and SOP-51.1?

HCV-14, Waste Gas Release Valve, will be verified closed (1)

Notify the Shift Supervisor, (2)

- A. 1) immediately from the MCB.
2) Chemistry, Health Physics, and I&C personnel.
- B. 1) by the Radside SO at the Waste Gas Panel.
2) Chemistry, Health Physics, and I&C personnel.
- C. 1) immediately from the MCB.
2) and the shift radiochemist **ONLY**.
- D. 1) by the Radside SO at the Waste Gas Panel.
2) and the shift radiochemist **ONLY**.

94. Unit 1 is at 25% power. A Unit 1 containment entry is planned for maintenance on the Moveable Incore Detector System (MIDS). Containment entry will be through the Emergency Air Lock.

IAW AP-42, Access Control, which one of the following states the positions that must **approve**:

(1) removal of the locking device from the MIDS power switch,

AND

(2) entry using the emergency personnel airlock?

 (1)

 (2)

A. Shift Supervisor

Shift Manager

B. Shift Supervisor

Operations Manager

C. Health Physics Supervisor

Shift Manager

D. Health Physics Supervisor

Operations Manager

95. Which one of the following is correct with respect to Tech Spec 3.3.1 Bases and the Final Safety Analysis Report (FSAR) for the following RPS Reactor Trips:

- Power Range Neutron Flux High Trip.
- Turbine Trip.

The Power Range Neutron Flux High Trip (1) designed to protect against a boron dilution event.

The Turbine Trip / Rx Trip (>P-9) (2) relied upon in the FSAR for RCS integrity protection.

	<u>(1)</u>	<u>(2)</u>
A.	IS	IS
B.	IS	IS NOT
C.	IS NOT	IS
D.	IS NOT	IS NOT

96. The following conditions exist on Unit 1:

- A Main Steam header rupture occurred in the Turbine Building 35 minutes ago while at 100% power.
- The MSIVs could not be closed from the MCB.
- SI termination using ECP-2.1, Uncontrolled Depressurization of All Steam Generators, is in progress.

Concurrently with securing the first charging pump, air is bled from 1A MSIV accumulator using SOP-17, Main and Reheat Steam, and the 1A SG pressure begins to rise.

- Pressurizer Level is 15%.
- RCS Pressure is 1880 psig.
- Subcooling Margin Monitor indicates 186°F and increasing.
- T_{COLD} are 418°F and decreasing.
- T_{HOT} is 423°F and decreasing.
- SG water levels, pressures and, AFW flows are as follows:

	<u>WR LEVEL</u>	<u>PRESS</u>	<u>AFW FLOW</u> <u>(throttled)</u>
- 1A SG	23%↑	305 psig ↑	20 gpm
- 1B SG	11%↓	295 psig ↓	20 gpm
- 1C SG	12%↓	290 psig ↓	20 gpm

Which one of the following describes the required procedure transition from ECP-2.1?

- A. Immediately transition to EEP-2, Faulted Steam Generator Isolation.
- B. Immediately transition to FRP-H.1, Response to Loss of Secondary Heat Sink.
- C. Remain in ECP-2.1 until SI is terminated, then transition to EEP-2, Faulted Steam Generator Isolation.
- D. Remain in ECP-2.1 until SI is terminated, then transition to FRP-H.1, Response to Loss of Secondary Heat Sink.

97. Unit 1 is at 18,000 MWD/MTU and has experienced a small break LOCA.

At 11:00, the following conditions exist:

- ESP-1.2, Post LOCA Cooldown and Depressurization, is in progress.
- A cooldown using the SG Atmospheric Relief Valves has been started.
- The RCS temperature has been as follows:

TIME	10:00	10:30	11:00
TEMP (°F)	535	485	440

- The current RCS boron concentration is 600 ppm.
- The Cold Shutdown boron concentration is 800 ppm.
- The required boron concentration for the current temperature is 578 ppm.

Which one of the following describes the status of the cooldown rate AND whether or not the Shutdown Margin requirements are met to continue the cooldown IAW ESP-1.2?

The allowable cooldown rate (1) been exceeded.

The cooldown (2) continue.

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

98. Unit 1 is performing a natural circulation cooldown in accordance with ESP-0.2, Natural Circulation Cooldown to Prevent Reactor Vessel Head Steam Voiding. The following conditions exist:

- RCS cold leg is 525°F.
- RCS pressure is 1900 psig.
- 1A and 1B CRDM fans are running.
- RCPs 1A, 1B, and 1C are tripped and cannot be restarted.
- CST level is 10.0 ft.
- AFW flow is 350 gpm
- RCS cooldown rate is 5°F/hr.
- PZR level is stable at 25%.
- RVLIS is not available.

Which one of the following is the correct response IAW ESP-0.2 and the maximum permitted cooldown rate to lower T_{COLD} to 500° F?

REFERENCE PROVIDED

Procedure names are as follows:

ESP-0.2, Natural Circulation Cooldown to Prevent Reactor Vessel Head Steam Voiding

ESP-0.4, Natural Circulation Cooldown With Allowance For Reactor Vessel Head Steam Voiding (Without RVLIS)

- A. • Continue with ESP-0.2.
- The maximum cooldown rate is <50°F/hr.
- B. • Continue with ESP-0.2.
- The maximum cooldown rate is 100°F in any 60 minute period.
- C. • Transition to ESP-0.4.
- The maximum cooldown rate is <50°F/hr.
- D. • Transition to ESP-0.4.
- The maximum cooldown rate is 100°F in any 60 minute period.

99. The following sequence of events occur on Unit 1:

At 10:00:

- EEP-1.0, Loss of Reactor or Secondary Coolant, is in progress.
- MOV-8706B, 1B RHR HX to CHG Pump Suct, is discovered with no indicating lights lit.
- SI RESET pushbuttons for both A and B trains were depressed with the following results:
 - MLB-1 1-1 is LIT.
 - MLB-1 11-1 is NOT LIT.

At 10:15:

- 1F 4160V Bus is de-energized and the 1-2A DG starts but fails to load.
- RWST level is 13 ft.

AT 10:45:

- The crew has begun cooldown using ECP-1.1, Loss of Emergency Coolant Recirculation.
- The TSC has restored power to MOV-8706B.
- RWST level is 4.5 ft.

Which one of the following describes:

1) the actions required to RESET SI at 10:00

AND

2) the actions required for the RWST level at 10:45?

- A. 1) S821 RESET switch must be placed in the RESET position.
- 2) Align for normal charging from the RWST, using ECP-1.1, Loss of Emergency Coolant Recirculation.
- B. 1) S821 RESET switch must be placed in the RESET position.
- 2) Align for cold leg recirculation using ESP-1.3, Transfer to Cold Leg Recirculation.
- C. 1) ESS STOP RESET pushbutton on the Sequencer panel must be depressed.
- 2) Align for normal charging from the RWST, using ECP-1.1, Loss of Emergency Coolant Recirculation.
- D. 1) ESS STOP RESET pushbutton on the Sequencer panel must be depressed.
- 2) Align for cold leg recirculation using ESP-1.3, Transfer to Cold Leg Recirculation.

100. The following plant conditions exist on Unit 1 following a Large Break LOCA:

- All automatic functions operated per design.
- Containment pressure peaked at 33 psig and is now 18 psig.
- RWST level indicates 12 feet 5 inches.
- ESP-1.3, Transfer to Cold Leg Recirculation, has been implemented; the crew has **NOT** yet begun to align ECCS for Cold Leg Recirculation.

- The indications for containment sump level are as follows:
 - LI-3594A, CTMT SUMP LVL, is reading 8.2 feet.
 - LR-3594B, POST ACCIDENT CTMT WTR LVL, is reading 8.2 feet.

Which one of the following is the correct procedural flow path for the event in progress AND the concern with this containment sump level?

- A. • Stop ESP-1.3 actions, implement FRP-Z.2, Response to CTMT Flooding, and then continue in ESP-1.3.
 - Damage to vital systems or components due to submersion.
- B. • Continue in ESP-1.3 until step 7, Align ECCS for cold leg recirculation, is complete, then implement FRP-Z.2, Response to Containment Flooding.
 - Damage to vital systems or components due to submersion.
- C. • Continue in ESP-1.3 until step 7, Align ECCS for cold leg recirculation, is complete, then implement FRP-Z.2, Response to Containment Flooding.
 - Damage to containment structure due to lateral forces on walls.
- D. • Stop ESP-1.3 actions, implement FRP-Z.2, Response to CTMT Flooding, and then continue in ESP-1.3.
 - Damage to containment structure due to lateral forces on walls.

SRO REFERENCES

Document	Title	Pages
FNP-0-EIP-9.2 Figure 1	Fission Product Barrier Evaluation Modes 1,2,3 and 4	Figure 1, pg 9 (1 page)
Tech Spec 3.3.1 (partial)	RTS Instrumentation	3.3.1-2 (partial) 3.3.1-3 (partial) (2 pages)
Tech Spec TABLE 3.3.1 (partial)	Reactor Trip System Instrumentation	3.3.1-14 (partial) (1 page)
Tech Spec 3.6.6	Containment Spray and Cooling Systems	3.6.6-1 through 3.6.6-2 (2 pages)
Tech Spec 3.5.5	Seal Injection flow	3.5.5-1 through 3.5.5-3 (3 pages)
ESP-0.2 Attachment 3	Calculation for Adequate Available CST Inventory	Attachment 3 (1 page)

ITEM STATISTICS REPORT
for RO exam from SRO SCORES RO combined

Test form: 0
Test version: 0

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
001AK2.06 1						
1	6	0	0	0	0	6
MCS	1.00	0.00	0.00	0.00	0.00	1.00
1.00	79.11	0.00	0.00	0.00	0.00	79.11
-	-	-	-	-	-	-
001K2.02 1						
2	6	0	1	0	5	0
MCS	0.83	0.00	0.17	0.00	0.83	0.00
1.00	79.11	0.00	76.00	0.00	79.73	0.00
-	+0.332	-	-0.332	-	+0.332	-
003A2.03 1						
3	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-
004G2.4.21 1						
4	6	0	0	0	1	5
MCS	0.83	0.00	0.00	0.00	0.17	0.83
1.00	79.11	0.00	0.00	0.00	76.00	79.73
-	+0.332	-	-	-	-0.332	+0.332
004K1.04 1						
5	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-
005A1.07 1						
6	6	0	3	1	2	0
MCS	0.50	0.00	0.50	0.17	0.33	0.00
1.00	79.11	0.00	80.44	76.00	78.67	0.00
-	+0.318	-	+0.318	-0.332	-0.075	-

ITEM STATISTICS REPORT
for RO exam from SRO SCORES RO combined

Overall		Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
005K4.03 1						
7	6	0	2	0	0	4
MCS	0.67	0.00	0.33	0.00	0.00	0.67
1.00	79.11	0.00	74.00	0.00	0.00	81.67
-	+0.862	-	-0.862	-	-	+0.862
006K6.13 1						
8	6	0	1	0	5	0
MCS	0.83	0.00	0.17	0.00	0.83	0.00
1.00	79.11	0.00	81.33	0.00	78.67	0.00
-	-0.237	-	+0.237	-	-0.237	-
007A3.01 1						
9	6	0	0	0	0	6
MCS	1.00	0.00	0.00	0.00	0.00	1.00
1.00	79.11	0.00	0.00	0.00	0.00	79.11
-	-	-	-	-	-	-
007EK2.02 1						
10	6	0	1	1	1	3
MCS	0.50	0.00	0.17	0.17	0.17	0.50
1.00	79.11	0.00	80.00	76.00	72.00	82.22
-	+0.742	-	+0.095	-0.332	-0.758	+0.742
008AA2.26 1						
11	6	0	0	0	0	6
MCS	1.00	0.00	0.00	0.00	0.00	1.00
1.00	79.11	0.00	0.00	0.00	0.00	79.11
-	-	-	-	-	-	-
008K3.01 1						
12	6	0	0	3	3	0
MCS	0.50	0.00	0.00	0.50	0.50	0.00
1.00	79.11	0.00	0.00	77.78	80.44	0.00
-	-0.318	-	-	-0.318	+0.318	-
008K4.09 1						
13	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-

ITEM STATISTICS REPORT

for RO exam from SRO SCORES RO combined

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	P					
Pts	Avg					
E.T.	rpb					
009EG2.1.23 1						
14	6	0	1	0	0	5
MCS	0.83	0.00	0.17	0.00	0.00	0.83
1.00	79.11	0.00	72.00	0.00	0.00	80.53
-	+0.758	-	-0.758	-	-	+0.758
010K1.03 1						
15	6	0	5	1	0	0
MCS	0.83	0.00	0.83	0.17	0.00	0.00
1.00	79.11	0.00	80.53	72.00	0.00	0.00
-	+0.758	-	+0.758	-0.758	-	-
011K 5.05 1						
16	6	0	0	0	6	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.11	0.00	0.00	0.00	79.11	0.00
-	-	-	-	-	-	-
012K2.01 1						
17	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-
012K6.03 1						
18	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-
013K2.01 2						
19	6	0	2	2	1	1
MCS	0.33	0.00	0.33	0.33	0.17	0.17
1.00	79.11	0.00	76.67	78.00	85.33	80.00
-	-0.187	-	-0.412	-0.187	+0.664	+0.095
013K5.01 1						
20	6	0	3	1	2	0
MCS	0.50	0.00	0.50	0.17	0.33	0.00
1.00	79.11	0.00	80.44	81.33	76.00	0.00
-	+0.318	-	+0.318	+0.237	-0.525	-

ITEM STATISTICS REPORT
for RO exam from SRO SCORES RO combined

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
015AK2.10 1						
21	6	0	0	5	0	1
MCS	0.83	0.00	0.00	0.83	0.00	0.17
1.00	79.11	0.00	0.00	78.67	0.00	81.33
-	-0.237	-	-	-0.237	-	+0.237
022A1.01 1						
22	6	0	0	0	6	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.11	0.00	0.00	0.00	79.11	0.00
-	-	-	-	-	-	-
022AK3.06 1						
23	6	0	1	2	3	0
MCS	0.33	0.00	0.17	0.33	0.50	0.00
1.00	79.11	0.00	85.33	76.00	79.11	0.00
-	-0.525	-	+0.664	-0.525	+0.000	-
026AA1.01 1						
24	6	0	0	6	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.11	0.00	0.00	79.11	0.00	0.00
-	-	-	-	-	-	-
026K1.01 1						
25	6	0	4	0	1	1
MCS	0.17	0.00	0.67	0.00	0.17	0.17
1.00	79.11	0.00	79.33	0.00	72.00	85.33
-	+0.664	-	+0.075	-	-0.758	+0.664
027AK1.02 1						
26	6	0	0	0	2	4
MCS	0.67	0.00	0.00	0.00	0.33	0.67
1.00	79.11	0.00	0.00	0.00	78.00	79.67
-	+0.187	-	-	-	-0.187	+0.187
027K1.01 1						
27	6	0	0	0	6	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.11	0.00	0.00	0.00	79.11	0.00
-	-	-	-	-	-	-

ITEM STATISTICS REPORT for RO exam from SRO SCORES RO combined

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
029EA1.06 1						
28	6	0	0	6	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.11	0.00	0.00	79.11	0.00	0.00
-	-	-	-	-	-	-
032AK3.02 1						
29	6	0	0	0	1	5
MCS	0.83	0.00	0.00	0.00	0.17	0.83
1.00	79.11	0.00	0.00	0.00	72.00	80.53
-	+0.758	-	-	-	-0.758	+0.758
035K3.02 5						
30	6	0	1	1	3	1
MCS	0.17	0.00	0.17	0.17	0.50	0.17
1.00	79.11	0.00	80.00	81.33	80.44	72.00
-	-0.758	-	+0.095	+0.237	+0.318	-0.758
037AA2.08 1						
31	6	0	3	2	1	0
MCS	0.33	0.00	0.50	0.33	0.17	0.00
1.00	79.11	0.00	81.78	78.67	72.00	0.00
-	-0.075	-	+0.636	-0.075	-0.758	-
038EA2.07 1						
32	6	0	5	0	1	0
MCS	0.83	0.00	0.83	0.00	0.17	0.00
1.00	79.11	0.00	78.93	0.00	80.00	0.00
-	-0.095	-	-0.095	-	+0.095	-
039K4.05 1						
33	6	0	0	0	0	6
MCS	1.00	0.00	0.00	0.00	0.00	1.00
1.00	79.11	0.00	0.00	0.00	0.00	79.11
-	-	-	-	-	-	-
041K4.14 1						
34	6	0	0	0	4	2
MCS	0.67	0.00	0.00	0.00	0.67	0.33
1.00	79.11	0.00	0.00	0.00	80.33	76.67
-	+0.412	-	-	-	+0.412	-0.412

ITEM STATISTICS REPORT for RO exam from SRO SCORES RO combined

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	P					
Pts	Avg					
E.T.	rpb					
045A1.05 1						
35	6	0	5	1	0	0
MCS	0.83	0.00	0.83	0.17	0.00	0.00
1.00	79.11	0.00	79.73	76.00	0.00	0.00
-	+0.332	-	+0.332	-0.332	-	-
051AA1.04 1						
36	6	0	0	6	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.11	0.00	0.00	79.11	0.00	0.00
-	-	-	-	-	-	-
054AG2.1.7 1						
37	6	0	5	0	1	0
MCS	0.83	0.00	0.83	0.00	0.17	0.00
1.00	79.11	0.00	78.93	0.00	80.00	0.00
-	-0.095	-	-0.095	-	+0.095	-
055EK3.02 1						
38	6	0	0	6	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.11	0.00	0.00	79.11	0.00	0.00
-	-	-	-	-	-	-
057AG2.4.49 1						
39	6	0	0	1	5	0
MCS	0.83	0.00	0.00	0.17	0.83	0.00
1.00	79.11	0.00	0.00	81.33	78.67	0.00
-	-0.237	-	-	+0.237	-0.237	-
059A2.04 1						
40	6	0	3	0	1	2
MCS	0.33	0.00	0.50	0.00	0.17	0.33
1.00	79.11	0.00	79.11	0.00	80.00	78.67
-	-0.075	-	+0.000	-	+0.095	-0.075
059G2.1.19 1						
41	6	0	0	0	5	1
MCS	0.83	0.00	0.00	0.00	0.83	0.17
1.00	79.11	0.00	0.00	0.00	80.53	72.00
-	+0.758	-	-	-	+0.758	-0.758

ITEM STATISTICS REPORT

for RO exam from SRO SCORES RO combined

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
061G2.2.37 1						
42	6	0	0	0	0	6
MCS	1.00	0.00	0.00	0.00	0.00	1.00
1.00	79.11	0.00	0.00	0.00	0.00	79.11
-	-	-	-	-	-	-
062A1.01 1						
43	6	0	1	4	1	0
MCS	0.67	0.00	0.17	0.67	0.17	0.00
1.00	79.11	0.00	80.00	77.33	85.33	0.00
-	-0.600	-	+0.095	-0.600	+0.664	-
063A3.01 1						
44	6	0	1	0	1	4
MCS	0.67	0.00	0.17	0.00	0.17	0.67
1.00	79.11	0.00	81.33	0.00	80.00	78.33
-	-0.262	-	+0.237	-	+0.095	-0.262
064A4.03 1						
45	6	0	0	1	0	5
MCS	0.83	0.00	0.00	0.17	0.00	0.83
1.00	79.11	0.00	0.00	80.00	0.00	78.93
-	-0.095	-	-	+0.095	-	-0.095
065AK3.04 1						
46	6	0	0	6	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.11	0.00	0.00	79.11	0.00	0.00
-	-	-	-	-	-	-
068K6.10 1						
47	6	0	0	5	1	0
MCS	0.83	0.00	0.00	0.83	0.17	0.00
1.00	79.11	0.00	0.00	80.53	72.00	0.00
-	+0.758	-	-	+0.758	-0.758	-
069AA2.01 1						
48	6	0	0	6	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.11	0.00	0.00	79.11	0.00	0.00
-	-	-	-	-	-	-

Deleted iaw
post-exam comment.

ITEM STATISTICS REPORT
for RO exam from SRO SCORES RO combined

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	P					
Pts	Avg					
E.T.	rpb					
071A4.01 1						
49	6	0	3	3	0	0
MCS	0.50	0.00	0.50	0.50	0.00	0.00
1.00	79.11	0.00	78.67	79.56	0.00	0.00
-	-0.106	-	-0.106	+0.106	-	-
072G2.1.27 1						
50	6	0	5	1	0	0
MCS	0.83	0.00	0.83	0.17	0.00	0.00
1.00	79.11	0.00	77.87	85.33	0.00	0.00
-	-0.664	-	-0.664	+0.664	-	-
073K3.01 1						
51	6	0	0	1	0	5
MCS	0.83	0.00	0.00	0.17	0.00	0.83
1.00	79.11	0.00	0.00	80.00	0.00	78.93
-	-0.095	-	-	+0.095	-	-0.095
074EA1.28 1						
52	6	0	0	5	0	1
MCS	0.83	0.00	0.00	0.83	0.00	0.17
1.00	79.11	0.00	0.00	80.53	0.00	72.00
-	+0.758	-	-	+0.758	-	-0.758
075A2.03 1						
53	6	0	2	1	0	3
MCS	0.50	0.00	0.33	0.17	0.00	0.50
1.00	79.11	0.00	80.00	72.00	0.00	80.89
-	+0.424	-	+0.150	-0.758	-	+0.424
076A3.02 1						
54	6	0	0	0	1	5
MCS	0.83	0.00	0.00	0.00	0.17	0.83
1.00	79.11	0.00	0.00	0.00	72.00	80.53
-	+0.758	-	-	-	-0.758	+0.758
077AA1.02 1						
55	6	0	0	3	0	3
MCS	0.50	0.00	0.00	0.50	0.00	0.50
1.00	79.11	0.00	0.00	79.11	0.00	79.11
-	+0.000	-	-	+0.000	-	+0.000

ITEM STATISTICS REPORT
for RO exam from SRO SCORES RO combined

		Overall	Omits	A (True)	B (False)	C	D
Item	Admins						
Type	p						
Pts	Avg						
E.T.	rpb						
078K2.02 1							
56	6	0	5	0	1	0	
MCS	0.83	0.00	0.83	0.00	0.17	0.00	
1.00	79.11	0.00	80.53	0.00	72.00	0.00	
-	+0.758	-	+0.758	-	-0.758	-	
103A4.03 1							
57	6	0	0	0	6	0	
MCS	1.00	0.00	0.00	0.00	1.00	0.00	
1.00	79.11	0.00	0.00	0.00	79.11	0.00	
-	-	-	-	-	-	-	
103K3.03 1							
58	6	0	5	0	0	1	
MCS	0.83	0.00	0.83	0.00	0.00	0.17	
1.00	79.11	0.00	78.93	0.00	0.00	80.00	
-	-0.095	-	-0.095	-	-	+0.095	
G2.1.17 1							
59	6	0	0	0	2	4	
MCS	0.67	0.00	0.00	0.00	0.33	0.67	
1.00	79.11	0.00	0.00	0.00	78.00	79.67	
-	+0.187	-	-	-	-0.187	+0.187	
G2.1.45 1							
60	6	0	1	0	3	2	
MCS	0.33	0.00	0.17	0.00	0.50	0.33	
1.00	79.11	0.00	76.00	0.00	79.11	80.67	
-	+0.262	-	-0.332	-	+0.000	+0.262	
G2.1.9 1							
61	6	0	0	0	0	6	
MCS	1.00	0.00	0.00	0.00	0.00	1.00	
1.00	79.11	0.00	0.00	0.00	0.00	79.11	
-	-	-	-	-	-	-	
G2.2.3 1							
62	6	0	5	0	0	1	
MCS	0.83	0.00	0.83	0.00	0.00	0.17	
1.00	79.11	0.00	80.53	0.00	0.00	72.00	
-	+0.758	-	+0.758	-	-	-0.758	

ITEM STATISTICS REPORT
for RO exam from SRO SCORES RO combined

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
G2.2.36 1						
63	6	0	3	1	2	0
MCS	0.50	0.00	0.50	0.17	0.33	0.00
1.00	79.11	0.00	82.22	76.00	76.00	0.00
-	+0.742	-	+0.742	-0.332	-0.525	-
G2.3.13 1						
64	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-
G2.3.15 1						
65	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-
G2.3.4 1						
66	6	0	0	0	6	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.11	0.00	0.00	0.00	79.11	0.00
-	-	-	-	-	-	-
G2.4.13 1						
67	6	0	0	0	0	6
MCS	1.00	0.00	0.00	0.00	0.00	1.00
1.00	79.11	0.00	0.00	0.00	0.00	79.11
-	-	-	-	-	-	-
G2.4.16 1						
68	6	0	5	1	0	0
MCS	0.83	0.00	0.83	0.17	0.00	0.00
1.00	79.11	0.00	78.67	81.33	0.00	0.00
-	-0.237	-	-0.237	+0.237	-	-
WE01EG2.2.2 1						
69	6	0	5	1	0	0
MCS	0.83	0.00	0.83	0.17	0.00	0.00
1.00	79.11	0.00	78.93	80.00	0.00	0.00
-	-0.095	-	-0.095	+0.095	-	-

ITEM STATISTICS REPORT
for RO exam from SRO SCORES RO combined

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	P					
Pts	Avg					
E.T.	rpb					
WE04EA2.2 1						
70	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-
WE05EK1.1 1						
71	6	0	0	1	5	0
MCS	0.83	0.00	0.00	0.17	0.83	0.00
1.00	79.11	0.00	0.00	85.33	77.87	0.00
-	-0.664	-	-	+0.664	-0.664	-
WE08EK1.1 1						
72	6	0	0	1	5	0
MCS	0.83	0.00	0.00	0.17	0.83	0.00
1.00	79.11	0.00	0.00	76.00	79.73	0.00
-	+0.332	-	-	-0.332	+0.332	-
WE11EK1.3 1						
73	6	0	0	0	6	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.11	0.00	0.00	0.00	79.11	0.00
-	-	-	-	-	-	-
WE12EK2.1 1						
74	6	0	0	2	1	3
MCS	0.50	0.00	0.00	0.33	0.17	0.50
1.00	79.11	0.00	0.00	80.00	76.00	79.56
-	+0.106	-	-	+0.150	-0.332	+0.106
WE16EK2.1 1						
75	6	0	6	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.11	0.00	79.11	0.00	0.00	0.00
-	-	-	-	-	-	-

ITEM STATISTICS REPORT

for SRO exam from SRO SCORES

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
<hr/>						
WE04EA2.2 1						
70	5	0	5	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.80	0.00	79.80	0.00	0.00	0.00
-	-	-	-	-	-	-
WE05EK1.1 1						
71	5	0	0	1	4	0
MCS	0.80	0.00	0.00	0.20	0.80	0.00
1.00	79.80	0.00	0.00	82.00	79.00	0.00
-	-0.438	-	-	+0.438	-0.438	-
WE08EK1.1 1						
72	5	0	0	0	5	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.80	0.00	0.00	0.00	79.80	0.00
-	-	-	-	-	-	-
WE11EK1.3 1						
73	5	0	0	0	5	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.80	0.00	0.00	0.00	79.80	0.00
-	-	-	-	-	-	-
WE12EK2.1 1						
74	5	0	0	2	0	3
MCS	0.60	0.00	0.00	0.40	0.00	0.60
1.00	79.80	0.00	0.00	82.00	0.00	78.33
-	-0.491	-	-	+0.491	-	-0.491
WE16EK2.1 1						
75	5	0	5	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.80	0.00	79.80	0.00	0.00	0.00
-	-	-	-	-	-	-
005G2.2.38 3						
76	5	0	0	5	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.80	0.00	0.00	79.80	0.00	0.00
-	-	-	-	-	-	-

ITEM STATISTICS REPORT
for SRO exam from SRO SCORES

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
007EA2.02 2						
77	5	0	2	0	3	0
MCS	0.40	0.00	0.40	0.00	0.60	0.00
1.00	79.80	0.00	82.00	0.00	78.33	0.00
-	+0.491	-	+0.491	-	-0.491	-
007G2.4.2 1						
78	5	0	1	3	1	0
MCS	0.60	0.00	0.20	0.60	0.20	0.00
1.00	79.80	0.00	73.00	82.33	79.00	0.00
-	+0.849	-	-0.930	+0.849	-0.109	-
008AG2.4.41 2						
79	5	0	5	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.80	0.00	79.80	0.00	0.00	0.00
-	-	-	-	-	-	-
014A2.04 6						
80	5	0	0	0	0	5
MCS	1.00	0.00	0.00	0.00	0.00	1.00
1.00	79.80	0.00	0.00	0.00	0.00	79.80
-	-	-	-	-	-	-
015G2.4.11 2						
81	5	0	5	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.80	0.00	79.80	0.00	0.00	0.00
-	-	-	-	-	-	-
022A2.01 2						
82	5	0	0	0	5	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.80	0.00	0.00	0.00	79.80	0.00
-	-	-	-	-	-	-
022AG2.4.50 1						
83	5	0	0	1	0	4
MCS	0.80	0.00	0.00	0.20	0.00	0.80
1.00	79.80	0.00	0.00	83.00	0.00	79.00
-	-0.438	-	-	+0.438	-	-0.438

ITEM STATISTICS REPORT for SRO exam from SRO SCORES

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
026A2.04 1						
84	5	0	0	0	0	5
MCS	1.00	0.00	0.00	0.00	0.00	1.00
1.00	79.80	0.00	0.00	0.00	0.00	79.80
-	-	-	-	-	-	-
027AA2.15 3						
85	5	0	0	0	5	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.80	0.00	0.00	0.00	79.80	0.00
-	-	-	-	-	-	-
027G2.2.42 1						
86	5	0	1	2	1	1
MCS	0.20	0.00	0.20	0.40	0.20	0.20
1.00	79.80	0.00	73.00	80.50	83.00	82.00
-	+0.301	-	-0.930	+0.156	+0.438	+0.301
065AG2.4.47 14						
87	5	0	2	1	0	2
MCS	0.40	0.00	0.40	0.20	0.00	0.40
1.00	79.80	0.00	77.50	83.00	0.00	80.50
-	-0.514	-	-0.514	+0.438	-	+0.156
076G2.4.11 2						
88	5	0	2	0	3	0
MCS	0.60	0.00	0.40	0.00	0.60	0.00
1.00	79.80	0.00	77.50	0.00	81.33	0.00
-	+0.514	-	-0.514	-	+0.514	-
078G2.2.42 1						
89	5	0	1	2	2	0
MCS	0.40	0.00	0.20	0.40	0.40	0.00
1.00	79.80	0.00	82.00	77.50	81.00	0.00
-	-0.514	-	+0.301	-0.514	+0.268	-
G2.1.31 1						
90	5	0	5	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.80	0.00	79.80	0.00	0.00	0.00
-	-	-	-	-	-	-

ITEM STATISTICS REPORT

for SRO exam from SRO SCORES

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
G2.2.36 5						
91	5	0	4	0	0	1
MCS	0.80	0.00	0.80	0.00	0.00	0.20
1.00	79.80	0.00	80.00	0.00	0.00	79.00
-	+0.109	-	+0.109	-	-	-0.109
G2.2.37 8						
92	5	0	5	0	0	0
MCS	1.00	0.00	1.00	0.00	0.00	0.00
1.00	79.80	0.00	79.80	0.00	0.00	0.00
-	-	-	-	-	-	-
G2.3.11 2						
93	5	0	0	3	0	2
MCS	0.60	0.00	0.00	0.60	0.00	0.40
1.00	79.80	0.00	0.00	79.33	0.00	80.50
-	-0.156	-	-	-0.156	-	+0.156
G2.3.12 2						
94	5	0	0	0	4	1
MCS	0.80	0.00	0.00	0.00	0.80	0.20
1.00	79.80	0.00	0.00	0.00	81.50	73.00
-	+0.930	-	-	-	+0.930	-0.930
G2.4.2 3						
95	5	0	1	0	0	4
MCS	0.80	0.00	0.20	0.00	0.00	0.80
1.00	79.80	0.00	83.00	0.00	0.00	79.00
-	-0.438	-	+0.438	-	-	-0.438
G2.4.20 1						
96	5	0	2	0	3	0
MCS	0.60	0.00	0.40	0.00	0.60	0.00
1.00	79.80	0.00	77.50	0.00	81.33	0.00
-	+0.514	-	-0.514	-	+0.514	-
WE03EG2 4.6 1						
97	5	0	0	0	5	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.80	0.00	0.00	0.00	79.80	0.00
-	-	-	-	-	-	-

ITEM STATISTICS REPORT
for SRO exam from SRO SCORES

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
Type	p					
Pts	Avg					
E.T.	rpb					
<hr/>						
WE10EA2.2 4						
98	5	0	0	0	5	0
MCS	1.00	0.00	0.00	0.00	1.00	0.00
1.00	79.80	0.00	0.00	0.00	79.80	0.00
-	-	-	-	-	-	-
WE11EG2.1.28 5						
99	5	0	0	5	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.80	0.00	0.00	79.80	0.00	0.00
-	-	-	-	-	-	-
WE15EA2.2 1						
100	5	0	0	5	0	0
MCS	1.00	0.00	0.00	1.00	0.00	0.00
1.00	79.80	0.00	0.00	79.80	0.00	0.00
-	-	-	-	-	-	-