Final Submittal
(Blue Paper)

COMBINED RO/SRO WRITTEN EXAM

WITH KAS, ANSWERS, REFERENCES,

CRYSTAL RIVER
OCTOBER 2007-301

RO AND SRO WRITTEN EXAM

INCLUDING K/As, References, Answers

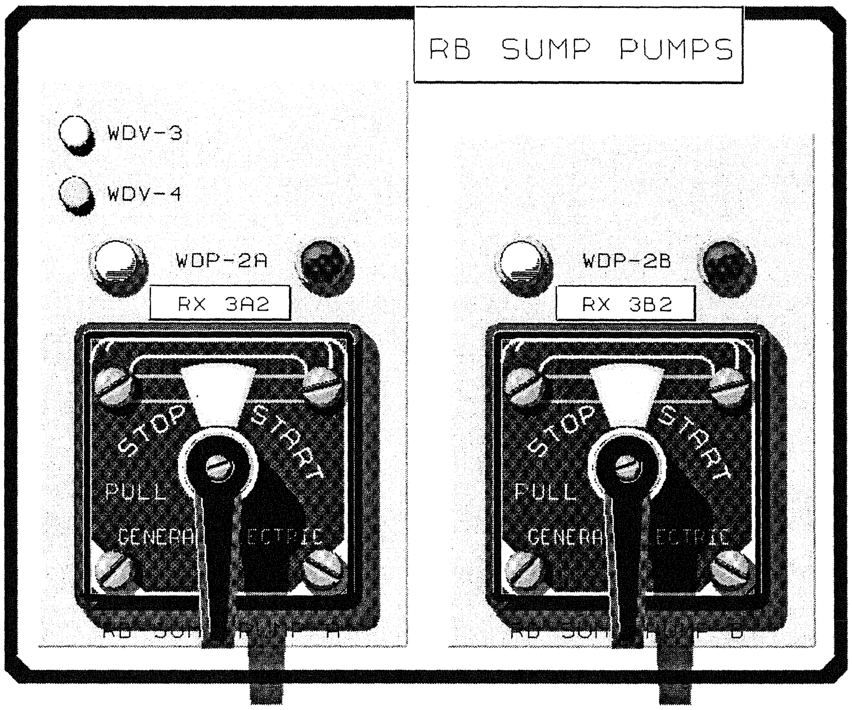
#	ID	Answers 0
1	002A3.01 1	D
2	003A4.03 1	C
3	004A3.15 1	C
4	004K5.26 1	B
5	005K5.09 1	B
6	006A4.08 1	C
7	006K4.21 1	D
8	007A2.02 1	A
9	008AK3.03 1	A
10	008K3.02 1	A
11	009EK2.03 1	D
12	010K3.03 1	D
13	011EA1.12 1	D
14	012A1.01 1	D
15	013K4.12 1	C
16	014A4.02 1	D
17	015/017AA2.10 1	C
18	016A2.02 1	D
19	022AG2.1.30 1	A
20	022K1.04 1	B
21	024AG2.4.47 1	A
22	025AK2.05 1	D
23	026AG2.4.46 1	B
24	026K2.02 1	D
25	027AK3.04 1	D
26	029EK1.03 1	D
27	033K3.03 1	D
28	034G2.4.31 1	B
29	035K6.03 1	C
30	038EK3.06 1	A
31	039A4.04 1	A
32	039K5.05 1	D
33	041G2.4.35 1	A
34	045K1.18 1	D
35	054AA1.03 1	D
36	055EA2.01 1	C
37	056AK3.02 1	C
38	057AA1.04 1	D
39	059A1.03 1	C
40	059K4.19 1	C
41	061AA1.01 1	C
42	061K1.10 1	B
43	062A2.12 1	B
44	062AA2.04 1	D
45	063K3.01 1	B
46	064A2.02 1	C
47	064K6.07 1	D
48	072K1.04 1	B

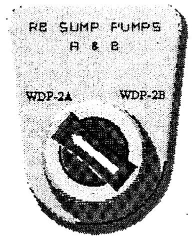
#	ID	Answers 0
49	073A1.01 1	B
50	073A4.03 1	A
51	074EK3.04 1	A
52	075K1.01 1	D
53	076AG2.2.22 1	C
54	076K4.02 1	D
55	078K1.04 1	D
56	078K2.01 1	A
57	103A4.06 1	D
58	BW/A01AA2.2 1	D
59	BW/A05AK1.3 1	D
60	BW/A08AK2.1 1	A
61	BW/E02EK2.1 1	C
62	BW/E03EA2.1 1	B
63	BW/E04EK3.3 1	B
64	BW/E05EK1.2 1	D
65	BW/E09EK3.1 1	A
66	G2.1.16 1	C
67	G2.1.32 1	B
68	G2.2.13 1	D
69	G2.2.28 1	C
70	G2.2.33 1	C
71	G2.3.2 1	A
72	G2.3.4 1	A
73	G2.4.10 1	D
74	G2.4.18 1	D
75	G2.4.25 1	A

1. 002A3.01 001/2/2/RO#1/C/A 3.7/3.9/NEW/R/CR03701/

With the plant aligned per the drawing below, which ONE of the following choices represents the automatic start functions associated with the RB Sump Pumps?

[Note that the white light labeled WDV-3 is lit]





A. WDP-2A will start at 12" and WDP-2B will start at 18".

B. WDP-2A will start at 18" and WDP-2B will start at 12".

C. WDP-2A will start at 12" but WDP-2B will not start.

D.✓ Neither WDP-2A or WDP-2B will automatically start.

Reasons:

A. With the indicated switch positions, if both WDV-3 and WDV-4 were open this would be the expected start setpoints. However, the white light for WDV-4 indicates that it is closed.

B. This would be the expected start setpoints if both WDV-3 and WDV-4 were open and the switch were selected to WDP-2B.

C. Plausible if student believes that WDV-3 and WDV-4 are in parallel rather than in series.

D. Correct. With either WDV-3 or WDV-4 closed (as indicated by the white light not lit) neither RB Sump Pump will start automatically.

OPS 4-59, Obj. 4; OPS 4-59 Section 1-4.0.F and 1-5.0.C

RO - New

Reference(s) provided: None

2. 003A4.03 001/2/1/RO#2/MEM 2.8/2.5/MOD/R/CR03701/4-060-008
Which ONE of the following conditions will cause a white permissive light to be lit for the "D" Reactor Coolant Pump, RCP-1D?

A. Seal injection flow to RCP-1D is 2 gpm.

B. Reactor power is 35%.

C.✔ Lift oil pressure to RCP-1D is 120 psig.

D. RCP-1D SW return flow is 250 gpm.

Reasons:

A. RCP seal injection flow start permissive is > 3 gpm per pump.

B. The Rx power start permissive for RCPs is < 30%.

C. Correct. The white permissive light lit indicates that the permissive is met. The setpoint for lift oil pressure is > 110 psig so the lift oil permissive light would be lit.

D. The SW return flow setpoint is > 260 gpm.

OPS 4-60, Obj. 4; OPS 4-60 Section 1-4.0.I.8; OP-302

RO - Modified

Reference(s) provided: None

3. 004A3.15 001/2/1/RO#3/C/A 3.5/3.6/NEW/R/CR03701/

The following plant conditions exist:

- Plant startup in progress.
- The plant is at normal operating pressure.
- Reactor power at 20%.
- MUV-31 is in manual

A malfunction has just occurred causing a Tave and PZR transient. After the transient the following plant conditions are noted:

- Tave is 576° F.
- PZR temperature is 610° F.

If RCS pressure reaches Psat for the current temperature which of the following describes the initial plant response?

A. Variable low pressure trip setpoint is reached; makeup flow lowers

B. Variable low pressure trip setpoint is not reached; makeup flow lowers

C.✓ Variable low pressure trip setpoint is reached; makeup flow rises

D. Variable low pressure trip setpoint is not reached; makeup flow rises

Reasons:

Psat for current PZR temp of 610° F is 1677 psig.
Psat for current Tave of 576° F is 1300 psig.
Power level of 20% equals a core delta T of 9° F . Thot = 580.5° F, Tcold = 571.5° F
Variable low pressure trip setpoint for 580.5° F is 1690 psig.
RCS low pressure trip setpoint is 1900 psig.

A. Since RCS pressure has lowered, makeup flow will rise.

B. Low pressure trip setpoint and variable low pressure trip setpoints are exceeded. Since RCS pressure has lowered, makeup flow will rise.

C. Correct. See explanation above. Since RCS pressure is lower, makeup flow will rise.

D. Low pressure trip setpoint and variable low pressure trip setpoints are exceeded.

OPS 4-12, Obj. 9; OPS 4-12 Section 1-4.0.C.2.h & i

RO - New

Reference(s) provided: Steam Tables

4. 004K5.26 001/2/1/RO#4/MEM 3.1/3.2/NEW/R/CR03701/

During normal full power operation a gas space leak occurs in the Makeup Tank (MUT-1) which results in the tank depressurizing to 1 psig. Following this depressurization, NPSH to the running MUP will be:

A. reduced but still adequate. Operation with this MUT level/pressure relationship will place the MUT in the "Preferred Operating Region" as shown in OP-103B, Plant Operating Curves.

B.✓ reduced but still adequate. Operation with this MUT level/pressure relationship will place the MUT in the "Acceptable Operating Region" as shown in OP-103B, Plant Operating Curves.

C. inadequate. Operation with this MUT level/pressure relationship will place the MUT in the "Restricted Operating Region" as shown in OP-103B, Plant Operating Curves.

D. inadequate. Operation with this MUT level/pressure relationship will place the MUT in the "Unacceptable Operating Region" as shown in OP-103B, Plant Operating Curves.

Reasons:

A. With a normal level of 80 to 90 inches operating with 1 psig overpressure will place the MUT in the Acceptable Operating Region.

B. Correct. The makeup pumps have adequate NPSH as long as the normal level band is maintained. In fact, AR-403 allows for operation below the alarm setpoint of 3 psig, as long as pressure is maintained > 0 psig. With a normal level of 80 to 90 inches operating with 1 psig overpressure will place the MUT in the Acceptable Operating Region.

C. Adequate NPSH can be maintained as long as normal level band is maintained with > 0 psig in the makeup tank.

D. Adequate NPSH can be maintained as long as normal level band is maintained with > 0 psig in the makeup tank.

OPS 4-52, Obj. 7; OPS 4-52 Section 1-4.0.P; OP-103B; OP-402; AR-403

RO - New

Reference(s) provided: None

5. 005K5.09 001/2/1/RO#5/C/A 3.2/3.4/NEW/R/CR03701/

The following plant conditions exist:

- The plant is being shutdown and cooled down for maintenance.
- All RCPs have been secured.
- RCS temperature is 150° F.
- RCS pressure is 250 psig.

It is desired to secure both DHPs for 30 minutes. Given the requirements (1-3) below, which ONE of the following describes the combination of Technical Specification requirements that are required to be met to allow this activity?

(1) Ensure core outlet temperature will remain subcooled for the duration.
(2) Ensure no activities which could reduce RCS boron occur.
(3) Ensure no RCS drain activities occur.

A. (2) only

B.✔ (1) and (2) only

C. (1) and (3) only

D. (1), (2), and (3)

Reasons:

A. This would be the only requirement per LCO 3.9.4 if the plant were in Mode 6 with refueling canal level at least 156'.

B. Correct. The plant is in Mode 5 with the loops filled. Under these circumstances, LCO 3.4.6 would apply. This LCO has a note allowing both DHPs and all RCPs to be secured for up to 1 hour, as long as requirements (1) and (2) above are met.

C. Under these circumstances RCS drain activities would not be specifically prohibited and activities that would lower RCS boron are prohibited.

D. These requirements would need to be met per LCO 3.4.7 if the loops were not filled. Given that RCS pressure is still 250 psig the loops are filled.

OPS 4-54, Obj 10; OPS 5-01 Obj. 8; OPS 4-54 Section 1-10.0.C; ITS LCO 3.4.6

RO - New

Reference(s) provided: None

6. 006A4.08 001/2/1/RO#6/C/A 4.2/4.3/BANK/R/CR03701/4-013-014
The following plant conditions exist:

- A plant heatup and pressurization are in progress.
- Current RCS pressure is 300 psig.

Which ONE of the following describes the expected plant response of the ES actuation bistables if *no* operator action is taken?

A. HPI will actuate when RCS pressure reaches 1770 psig.

B. HPI will actuate when RCS pressure reaches 1625 psig.

C.✔ LPI will actuate when RCS pressure reaches 900 psig.

D. LPI will actuate when RCS pressure reaches 500 psig.

Reasons:

A. This is the setpoint to Bypass HPI. HPI will not actuate until these bistables are reset at 1800 psig.

B. HPI will not actuate until the 1800 psig Bypass bistables automatically reset.

C. Correct. LPI will actuate at 900 psig if the Actuation bistables have not been reset.

D. LPI will not actuate until the 900 psig Bypass bistables automatically reset.

OPS 4-13, Obj. 2; OPS 4-13 Sections 1-5.0.F.14 and 1-7.0.B.2

RO - Bank

Reference(s) provided: None

7. 006K4.21 001/2/1/RO#7/C/A 4.1/4.3/NEW/R/CR03701/

The plant is at normal full power operation.

Two (2) ES "B" Train 4 psig pressure switches have failed in the actuated condition.

Which ONE of the following sets of actions MUST be taken to prevent a reactor trip on high RCS pressure?

A. Bypass RBIC by selecting at least two (2) of the three (3) RB ISO RB1, RB2 and RB3 switches to Bypass and secure only the "C" MUP.

B. Bypass RBIC by selecting at least two (2) of the three (3) RB ISO RB1, RB2 and RB3 switches to Bypass and secure the "B" and "C" MUPs.

C. Select the ES "B" Train HPI Auto Test Select pistol grip to the push-in "Test 1" position and secure only the "C" MUP.

D.✔ Select the ES "B" Train HPI Auto Test Select pistol grip to the push-in "Test 1" position and secure the "B" and "C" MUPs.

Reasons:

HPI cross-tie valves open and "B" Train HPI valves open. Both MUPs must be secured to stop flow.

With 2 pressure switches failed bypassing RBIC is not an option.

A. With 2 pressure switches failed bypassing RBIC is not an option. Also both MUPs must be secured.

B. With 2 pressure switches failed bypassing RBIC is not an option.

C. Both MUPs must be secured.

D. Correct. Since RBIC cannot be bypassed due to the failure the cascading HPI actuation must be blocked using the HPI Auto Test Select pistol grips. This will allow the MUPs to be secured stopping full HPI flow to the RCS.

OPS 4-13, Obj. 2; OPS 4-13 Section 1-2.0.D, Table 2, Table 4; OPS 4-13, Section 1-4.0.F.14.o; AP-340 Steps 3.2 & 3.3

RO - NEW

Reference(s) provided: None

8. 007A2.02 001/2/1/RO#8/C/A 2.6/3.2/NEW/R/CR03701/

While operating at 100% power the RCDT pressure is observed to be reading abnormally high at 6 psig. Attempts to reduce RCDT pressure via venting were unsuccessful. Which ONE of the following choices represents a potential consequence of this condition and the appropriate method for reducing pressure IAW OP-407J, Operation of the RCDT?

A.✔ Diversion of RCP seal leakoff to the RB sump.
Blowdown the loop seal using N2.

B. Diversion of RCP seal leakoff to the RB sump.
Raise SW flow to the RCDT.

C. Unacceptable Code Safety valve setpoint shift.
Blowdown the loop seal using N2.

D. Unacceptable Code Safety valve setpoint shift.
Raise SW flow to the RCDT.

Reasons:

A. Correct. Pressures > 4 psig in the RCDT can cause the RCP seal leakoff standpipes to overflow to the RB sump. The proceduralized method for correcting this condition is to first attempt to vent the RCDT. If this is unsuccessful, the procedure directs an attempt to blowdown the loop seal using nitrogen.

B. SW flow to the RCDT is not normally adjusted, and this method is not procedurally directed.

C. The Code Safety valves function correctly with up to 700 psig back pressure.

D. The Code Safety valves function correctly with up to 700 psig back pressure. SW flow to the RCDT is not normally adjusted, and this method is not procedurally directed.

OPS 4-59, Obj. 5; OP-407J Limit and Precaution 3.2.3.

RO - New

Reference(s) provided: None

9. 008AK3.03 001/1/1/RO#9/MEM 4.1/4.6/NEW/R/CR03701/
A step in EOP-8A, LOCA Cooldown, states:

"Ensure only 1 ES selected RB cooling unit running in low speed."

Which ONE of the following describes the reason for this step per the EOP-8A TBD?

A.✓ SW temperatures could exceed design limits if the RB Fan Coolers were in a clean, non-degraded condition.

B. SW temperatures could exceed design limits if the RB Fan Coolers were in a fouled, degraded condition.

C. This mode of operation will allow one of the ES selected RB cooling units to remain as a backup in the event the running cooling unit were to fail.

D. Analysis has determined that two RB cooling units operating simultaneously in a high density, post LOCA atmosphere, may cause fan suction ductwork damage.

Reasons:

A. Correct. With the coolers in a non-degraded condition the improved heat transfer rate could cause the SW temperature to increase above the design limit.

B. With the coolers degraded the SW temperature would be lower, not higher.

C. Plausible because a post LOCA atmosphere will require the fans to work much harder and will be more susceptable to failure.

D. An analysis was performed for this case but the high SW temperatures is the overriding reason for this step.

OPS 5-85 Obj. 2; EOP-TBD Cross Step Document for EOP-8A

RO - New

Reference(s) provided: None

10. 008K3.02 001/2/1/RO#10/MEM 2.9/3.1/NEW/R/CR03701/
The air supply line to SWV-763 (CRDM Temperature Control Valve) fails causing a loss of air to the valve.

SWV-763 will fail ___(1)___ and the Control Rod Drives may experience ___(2)___.

A.✔ (1) open
(2) excessive moisture due to condensation

B. (1) open
(2) insulation damage due to overheating

C. (1) closed
(2) excessive moisture due to condensation

D. (1) closed
(2) insulation damage due to overheating

Reasons:

A. Correct. On a loss of air the valve will fail open. This will allow more flow through the stators and less recirc flow. This will lead to overcooling which could cause moisture and condensation in the stators.

B. Plausible if the student believes the temperature control valve is in the 'recirc' portion of the line, which would lead to excessive warm water recirc to the suction and overheating.

C. The valve actually fails open. Plausible if the student believes that the temperature control valve is in the 'recirc' portion of the line, which would prevent recirc of the warmer water back to the suction.

D. The valve actually fails open. Plausible since if the valve did fail closed, insulation damage due to overheating would be possible.

OPS 4-56, Obj. 4 & 7; OPS 4-56 Section 1-4.0.F.6; OP-411 Enclosure 7

RO - New

Reference(s) provided: None

11. 009EK2.03 001/1/1/RO#11/C/A 3.0/3.3/NEW/R/CR03701/
The plant has experienced an RCS leak of approximately 150 gpm. A cooldown to Mode 5 is in progress, with current RCS temperature at 460° F. The RCS temperature 30 minutes ago was 500° F and 60 minutes ago RCS temperature was 535° F.

The cooldown rate is ___(1)___ and the cooldown rate ___(2)___.

A. (1) excessive
(2) cannot be controlled due to HPI/break cooling

B. (1) excessive
(2) can be controlled by adjusting TBVs or ADVs

C. (1) acceptable
(2) cannot be controlled due to HPI/break cooling

D.✓ (1) acceptable
(2) can be controlled by adjusting TBVs or ADVs

Reasons:

A. The cooldown rate is 75°F per hour, which is less than the 50°F per 1/2 hour limit. Also, EOP-8A contains a note that cooldown may be excessive due to HPI flow. However, this note would apply to much larger breaks.

B. The cooldown rate is 75°F per hour, which is less than the 50°F per 1/2 hour limit.

C. Plausible since EOP-8A contains a note that cooldown may be excessive due to HPI flow. However, this note would apply to much larger breaks.

D. Correct. The cooldown rate is acceptable at 75°F per hour (40°F per 1/2 hour). With a LOCA of 150 gpm, some HPI/break cooling would occur, but OTSG heat removal would still be required.

OPS 3-21, Obj. 2; EOP-8A Table 2; OPS 3-21 Section 1-2.0.B.5.b) 2); OPS 3-21 Section 1-5.0.C

RO - New

Reference(s) provided: None

12. 010K3.03 001/2/1/RO#12/C/A 4.0/4.2/MOD/R/CR03701/4-009-005

The following plant conditions exist:

- A normal plant cooldown is in progress.
- RCS pressure is 1550 psig.
- Control Rod Group 1 is fully withdrawn.

The RCS narrow range pressure SASS module output fails high. With no operator action which ONE of the following describes the resulting plant response?

A. RPS bistable trip on low pressure.

B. RPS bistable trip on high pressure.

C. HPI bistable trip.

D.✓ LPI bistable trip.

Reasons:

A. Actual RCS pressure will lower with this failure. However, with the given plant conditions RPS must be in shutdown bypass. This will prevent the trip on RCS low pressure.

B. With the failure occurring at the SASS modules RPS would still see actual RCS pressure. No RPS bistable trip on high pressure would occur.

C. Pressure is already below the HPI bypass and actuation setpoints. HPI would have been bypassed already on a normal shutdown and would not actuate.

D. Correct. This failure will cause the PORV to open which will cause actual RCS pressure to lower. With no operator action, RCS pressure will lower to the LPI actuation setpoint. At a pressure of 1550 psig, LPI would not yet be bypassed so LPI would actuate.

OPS 4-09, Obj. 4 & 7; OPS 4-09 Section 1-4 and Figure 5

RO - Modified

Reference(s) provided: None

13. 011EA1.12 001/1/1/RO#13/C/A 4.1/4.4/NEW/R/CR03701/
The following plant conditions exist:

- A Large Break LOCA has occurred.
- Some fuel damage has occurred.
- ECCS suction transfer to RB sump has just been completed.
- Alarm Window H-02-02 "Atmospheric Monitor Warning" is received.
- RM-A8 "Aux Bldg Exhaust Duct" counts are rising with the "Warn" light lit.

Uncontrolled radiation leakage to the environment is limited by Aux Bldg Ventilation supply isolation which:

A. occurred as a result of the Reactor Building Isolation and Cooling (RBIC) actuation.

B. occurred as a result of the High Pressure Injection (HPI) actuation.

C. will occur when RM-A8 reaches the high alarm setpoint.

D.✓ will occur when RM-A2 reaches the high alarm setpoint.

Reasons:

A. An RBIC actuation will isolate the Control Complex ventilation but not the AB ventilation.

B. An HPI actuation will isolate many components but not the AB ventilation.

C. RM-A8 has no automatic functions associated with it.

D. Correct. When RM-A2 reaches the high alarm setpoint, AHF-30, 11A/B, 10, 9A/B will all stop. This ensures a negative pressure is maintained in the Aux Bldg which ensures activity will be released through the monitored/filtered AHF-14 fans.

OPS 4-25, Obj. 4; OPS 4-25 Section 1-4.0.F.4.h), OPS 4-86 Section 1-2.0.D.1; AP-250

RO - New

Reference(s) provided: None

14. 012A1.01 001/2/1/RO#14/MEM 2.9/3.4/BANK/R/CR03701/4-012-026

The following plant conditions exist:

- RCS Pressure is 920 psig.
- Cooldown to Mode 5 in progress.
- All RPS channels in Shutdown Bypass.
- Group 1 Control Rods fully withdrawn.

A transient occurs which results in an uncontrolled rise in RCS pressure. All RPS channels fail to trip at the high pressure setpoint associated with shutdown bypass operation.

Which ONE of the following statements describes the next RCS high pressure trip protection which is required/available as pressure continues to rise?

A. No automatic actions will occur until pressure reaches the Diverse Scram System actuation setpoint.

B. The associated RPS channels will come out of bypass and the normal RPS high pressure trip bistables will actuate and trip the RPS channels.

C. Shutdown Bypass automatically changes the RPS high pressure trip setpoint to a lower value.

D.✔ A second high pressure trip bistable with a setpoint higher than the Shutdown Bypass high pressure trip setpoint will actuate and trip the RPS channels.

Reasons:

A. An RPS automatic trip will occur at 2355. This is below the DSS setpoint. Also, if the groups 1 rods are on the DC Hold bus, DSS will not trip them.

B. RPS channels do not come out of bypass when trip functions are exceeded.

C. Shutdown Bypass does not bypass the RPS high pressure trip contact set at 2355 psig or adjust its setpoint to a lower value.

D. Correct. The 2355 psig high pressure trip contact is still functional in the RPS trip string and will actuate to trip the associated RPS channels.

OPS 4-12, Obj. 4; OPS 4-12 Section 1-3.0.C.3

RO - Bank

Reference(s) provided: None

15. 013K4.12 001/2/1/RO#15/MEM 3.7/3.9/NEW/R/CR03701/

The following plant conditions exist:

- RCS Pressure 1920 psig.
- A cooldown to Mode 5 is in progress.

Of the following choices, the **highest** pressure at which HPI can be bypassed is __(1)__ and once it is bypassed an automatic RBIC signal __(2)__ cause an HPI actuation.

A. (1) 1820 psig
(2) will

B. (1) 1820 psig
(2) will not

C.✓ (1) 1750 psig
(2) will

D. (1) 1750 psig
(2) will not

Reasons:

A. The HPI bypass setpoint is < 1770 psig. 1820 psig is the RPS SD Bypass high pressure setpoint.

B. The HPI bypass setpoint is < 1770 psig. 1820 psig is the RPS SD Bypass high pressure setpoint. Both an RBIC and LPI signal will still cascade and cause an HPI actuation while HPI is bypassed.

C. Correct. 1750 psig is below the bypass setpoint of < 1770 psig. And, both an RBIC and LPI signal will still cascade and cause an HPI actuation while HPI is bypassed.

D. Both an RBIC and LPI signal will still cascade and cause an HPI actuation while HPI is bypassed.

OPS 4-13, Obj. 2; OPS 4-13 Section 1-2.0.C.11

RO - New

Reference(s) provided: None

16. 014A4.02 001/2/2/RO#16/MEM 3.4/3.2/BANK/R/CR03701/ROT-4-028-079

Based on the following plant conditions:

- All ICS stations are in "AUTO" except for the Unit Load Master (ULD) which is in hand.
- Unit is at 79% with a power escalation in progress at 15 MWe per hour.
- "JOG" speed is selected on the Diamond Control Panel.

Which ONE of the following statements is correct regarding control rod speed during a Loss of Main Feedwater Pump runback?

A. Control rod speed will reduce reactor power at 30% per minute.

B. Control rod speed will reduce reactor power at 50% per minute.

C. Control rods insert at a rate of 3" per minute.

D.✓ Control rods insert at a rate of 30" per minute.

Reasons:

A. This is the runback rate for a dropped rod, not the MFWP runback rate.

B. While the loss of MFWP runback is designed to take place at 50% per minute, the reactor subsystem (i.e. the rods) cannot reduce power fast enough to accomplish this rate.

C. The normal speed when JOG is selected is 3" per minute. However, whenever the diamond panel is in auto, rod speed is 30" per minute regardless of speed selector switch position.

D. Correct. With the diamond panel in auto, rod speed is 30" per minute regardless of the speed selector switch position.

OPS 4-28, Obj. 4 & 7; OPS 4-28 Section 1-4.0.M.1.c)4); OPS 4-14 Section 1-4.0.F.4.e)4)

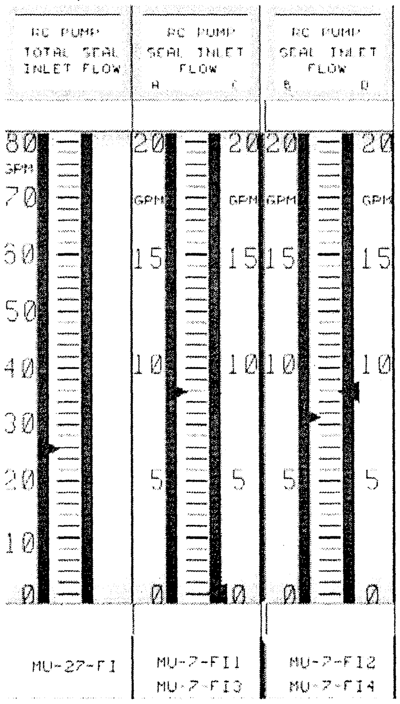
RO - Bank

Reference(s) provided: None

17. 015/017AA2.10 001/1/1/RO#17/C/A 3.7/3.7/BANK/R/CR03701/4-060-011

The following plant conditions exist:

- The reactor is currently at 85% power.
- MUV-16, Seal Injection flow control valve, failed closed while in automatic.
- MUV-16 manual control has been selected and seal injection flow is being restored.
- Seal injection flows to each Reactor Coolant Pump (RCP) are as depicted below:



What action(s) should be taken with respect to the RCPs if *SW flow* to the RCPs is lost? (Assume no further actions taken for seal flow.)

RCP-1C must be tripped:

A. within two minutes. All other RCPs can continue to operate.

B. within five minutes. All other RCPs can continue to operate.

C.✔ within two minutes. All other RCPs must be tripped within five minutes.

D. immediately. All other RCPs must be tripped within five minutes.

Reasons:

A. RCP-1A, 1B & 1D may operate a maximum of five minutes with a loss of SW to the motors.

B.. RCP-1C must be tripped within two minutes due to loss of both SI and SW to the seals.

C. Correct. SW and seal injection have been lost to RCP-1C and it must be secured within 2 minutes. All RCPs have lost SW, so RCP-1A, B, and D must be secured within 5 minutes.

D. RCP-1C may operate for up to two minutes.

OPS 4-60, Obj. 9; OP-302 Step 3.2.4 & 3.2.5

RO - Bank

Reference(s) provided: None

18. 016A2.02 001/2/2/RO#18/MEM 2.9/3.2/NEW/R/CR03701/NEW
Which ONE of the following describes how a loss of NNI-X DC affects the operation of MUV-16, Seal Injection Control Valve, and the appropriate procedure for addressing the failure?

A. MUV-16 fails closed. Utilize the guidance in OP-402, Operation of the Makeup and Purification System, to restore seal injection flow.

B. MUV-16 fails closed. Utilize the guidance in AP-581, Loss of NNI-X, to restore seal injection flow.

C. MUV-16 will remain in its current position. Utilize the guidance in OP-402, Operation of the Makeup and Purification System, for proper valve operation.

D.✔ MUV-16 will remain in its current position. Utilize the guidance in AP-581, Loss of NNI-X, for proper valve operation.

Reasons:

A. MUV-16 will fail as is with no indicating lights or automatic control. AP-581 should be used for guidance.

B. MUV-16 will fail as is with no indicating lights or automatic control.

C. AP-581 should be used for guidance.

D. Correct. MUV-16 will fail as is with no indicating lights or automatic control. Manual control is still available.

OPS 4-09, Obj. 3 & 7; OPS 5-81 Obj. 7; OPS 4-09 Section 1-8.0.B.4.g; AP-581 Enclosure 4

RO - NEW

Reference(s) provided: None

19. 022AG2.1.30 001/1/1/RO#19/C/A 3.9/3.4/NEW/R/CR03701/

The following plant conditions exist:

- MUP-1A was running with MUP-1A and MUP-1C ES selected.
- MUP-1A experienced an overcurrent trip due to a motor fault.

It is now desired to start MUP-1B to restore MU flow, with both MUP-1B and MUP-1C ES selected. Where is the switch that will be used to ES select MUP-1B?

A.✔ "A" ES 4160V Switchgear Room

B. "B" ES 4160V Switchgear Room

C. MUP-1B Pump Area

D. "A" 480V Switchgear Room

Reasons:

A. Correct. In this case, the ES select switch on MUP-1C breaker cubicle will be selected to MUP-1C. MUP-1B will need to be 'A' ES selected. The switch to accomplish this is located on the breaker cubicle for MUP-1A.

B. This is the location if MUP-1B were to be 'B' ES selected. Since MUP-1C will remain ES selected, MUP-1B must be 'A' ES selected.

C. The transfer switch for aligning power to MUP-1B from either the 'A' or 'B' ES 4160V bus is located here. However, this is not how the pump is ES selected.

D. The transfer switch for ES MCC 3AB is located in this room, not the MUP selector switch.

OPS 4-52, Obj. 3; OPS 4-52 Section 1-4.0.S.7; OP-402 Step 4.4.6

RO - New

Reference(s) provided: None

20. 022K1.04 001/2/1/RO#20/MEM 2.9/2.9/BANK/R/CR03701/4-063-008

Which ONE of the following describes a feature that is utilized in the "Mechanical" cooling mode in the Industrial Cooling System, but not in the "Free" cooling mode?

Passing the CI system water loop flow through the:

A. Heat Exchanger (CIHE-3).

B.✓ RB Chiller (CIHE-4A/4B).

C. Cooling Tower (CIHE-1A/1B).

D. Electric Water Heaters (CIHE-2A/2B).

Reasons:

A. CIHE-3 is used in the free mode only.

B. Correct. The mechanical cooling mode is the only mode that has the RB chiller in operation.

C. Both modes (free and mechanical) utilize the cooling tower.

D. Only water from the closed loop system can pass through the water heaters.

OPS 4-63, Obj. 3-2 & 3-3; OPS 4-63 Section 3-4.0.C.2

RO - Bank

Reference(s) provided: None

21. 024AG2.4.47 001/1/2/RO#21/C/A 3.4/3.7/NEW/R/CR03701/

Following a reactor trip three control rods did not fully insert into the core. Which ONE of the following sets of actions/parameters satisfies the boration requirements for this condition IAW EOP-2, Vital System Status Verification?

A.✔ Start CAP-1A and borate through CAV-60.
MUT level rise of 5 inches over 10 minutes.
PZR level is constant.

B. Start CAP-1B and borate using the Batch Controller.
MUT level rise of 5 inches over 10 minutes.
PZR level is constant.

C. Open the BWST suction valves.
MUT level is constant.
PZR level rise of 5 inches over 10 minutes.

D. Open the BWST suction valves.
MUT level rise of 5 inches over 10 minutes.
PZR level lowers 7 inches over 10 minutes.

Reasons:

A. Correct. EOP-2 actions require boration with CAP-1A/1B and CAV-60. MUT level rise equates to 15 gpm flow. Minimum required is 10 gpm.

B. Per EOP-2 if CAV-60 does not open then the BWST suction valves should be opened. Use of the Batch Controller is not addressed.

C. BWST suction valves are allowed but the PZR level rise only equates to 6 gpm flow. Minimum flow is 10 gpm.

D. BWST suction valves are allowed but the difference between MUT rise and PZR level lowering only equates to 6.6 gpm flow. Minimum flow is 10 gpm.

OPS 5-96, Obj. 6; EOP-2, Step 3.4

RO - NEW

Reference(s) provided: None

22. 025AK2.05 001/1/1/RO#22/C/A 2.6/2.6/BANK/R/CR03701/5-099-002
The plant is in Mode 5 with the following plant conditions:

- "A" Decay Heat Removal Pump (DHP-1A) is in service.
- The Reactor Building (RB) sump level is rising.
- RM-A6 (RB ventilation duct) is rising and is now in HIGH alarm.
- The "A" 480V ES bus has just lost power due to a bus fault.

Which of the following procedures will contain guidance for this situation?

A. AP-404, Loss of Decay Heat Removal, only.

B. AP-520, Loss of RCS Coolant or Pressure, only.

C. AP-520, Loss of RCS Coolant or Pressure, and AP-250, Radiation Monitor Actuation.

D.✔ AP-404, Loss of Decay Heat Removal, and AP-520, Loss of RCS Coolant or Pressure.

Reasons:

A. AP-520 is required due to the RCS leak.

B. DCP-1A will not be running, the "A" DH train must be secured (AP-404). AP-520 is required due to the RCS leak.

C. AP-250 is not entered for RM-A6.

D. Correct. DCP-1A will not be running, the "A" DH train must be secured (AP-404). AP-520 is required due to the RCS leak.

AP-404 Entry Conditions; AP-520 Entry Conditions

RO - Bank

Reference(s) provided: None

23. 026AG2.4.46 001/1/1/RO#23/C/A 3.5/3.6/NEW/R/CR03701/
Nuclear Services Closed Cycle Cooling surge tank (SWT-1) low level alarm has just been received. Which ONE of the following describes conditions that could cause this alarm?

A. SWHE-1A tube leak coincident with an SW Differential Flow alarm.

B.✓ RCDT cooler tube leak coincident with an SW Differential Flow alarm.

C. PZR Sample Cooler tube leak coincident with an RM-L3 radiation monitor warning alarm.

D. Reactor Coolant Pump seal return cooler tube leak coincident with an RM-L3 radiation monitor warning alarm.

Reasons:

A. SWT-1 level will decrease but the flow alarm only monitors SW flow into and out of the RB.

B. Correct. SW pressure is higher than RCDT pressure and this flowpath is monitored by SW differential flow meters.

C. A tube leak in this cooler will cause RM-L3 to alarm but will result in an increase in SWT-1 level, not decrease.

D. A tube leak in this cooler will result in a decrease in SWT-1 level but will not cause RM-L3 to alarm.

OPS 4-56, Obj. 2; OPS-4-56 1-6.0

RO - New

Reference(s) provided: None

24. 026K2.02 001/2/1/RO#24/MEM 2.7/2.9/NEW/R/CR03701/
Which ONE of the following is the power supply to BSV-4, RB Spray Header Inlet Isolation Valve?

A. DPDP-8A

B. DPDP-8B

C. ES MCC 3A1

D.✓ ES MCC 3B2

Reasons:

A. DPDP-8A does provide power to a number of MOVs, but not to BSV-4.

B. DPDP-8B does provide power to a number of MOVs, but not to BSV-4.

C. This is the power supply for BSV-3 (A Train).

D. Correct. BSV-4 is the B Train valve, and is powered from ES MCC 3B2.

OPS 4-62 Obj. 3; OPS 4-62 Section 1-4.0.C.2; OP-700B Enclosure 21

RO - New

Reference(s) provided: None

25. 027AK3.04 001/1/1/RO#25/C/A 2.8/3.3/NEW/R/CR03701/

The following plant conditions exist:

- The plant tripped from 100% power due to a loss of RCP-1B.
- Following the trip, ADV MSV-26 failed open.
- Prior to isolating the ADV, pressurizer level lowered to 10".
- MSV-26 has been isolated and the overcooling terminated.
- Tincore is now 546° F and stable.
- RCS pressure is 1835 psig.
- Pressurizer level has just been stabilized at 100".
- Pressurizer temperature is currently reading 590° F.

Over the next several minutes RCS pressure will:

A. rise because spray flow has been lost with the trip of RCP-1B.

B. rise because pressurizer heaters are raising pressurizer temperature.

C. lower because all heaters remain de-energized until manually reset.

D.✔ lower because subcooled liquid insurged into the pressurizer.

Reasons:

A. With RCS pressure at 1835 psig, the only spray that would normally be present is the ~ 1.5 gpm bypass flow. While this would be affected by the loss of the RCP, it would be negligible.

B. Pressurizer heaters would be adding heat to the liquid. However the liquid is currently ~ 35° F subcooled. The short term effect of this would be heat transfer from the vapor to the liquid which would result in lowering pressure.

C. Pressurizer heaters automatically de-energized when level went below 40". Now that level has been restored, banks D and E would be energized. A, B, and C would have power available, but their controller would have reverted to manual with 0 demand.

D. Correct. Pressurizer water space temperature is 590° F, which is ~ 35° F subcooled. The short term effect of this would be heat transfer from the vapor to the liquid which would result in lowering pressure.

OPS 4-60, Obj. 3; OPS 4-60 Section 1-4.0.E; SEN-248

RO - New

Reference(s) provided: Steam Tables

26. 029EK1.03 001/1/1/RO#26/C/A 3.6/3.8/NEW/R/CR03701/

The following plant conditions exist:

- The plant was operating near beginning of life.
- A seismic event has occurred.
- The plant was tripped per AP-961 "Earthquake".
- While CRD groups 1-7 fully inserted, a large number of individual rods remain stuck out.
- Power range NIs indicate 4% and stable.

The required EOP-2 Immediate Action for these conditions is ___(1)___ and the reactivity effect of taking this action would be ___(2)___ negative at BOL than at EOL.

A. (1) De-energize the CRD System
(2) more

B. (1) De-energize the CRD System
(2) less

C. (1) Start emergency boration
(2) more

D.✓ (1) Start emergency boration
(2) less

Reasons:

A. This action would be required if one or more groups had failed to insert. Since only individual rods failed to insert power has already been removed from all rod groups. De-energizing the CRD system would have no added benefit.

B. This action would be required if one or more groups had failed to insert. Since only individual rods failed to insert power has already been removed from all rod groups. De-energizing the CRD system would have no added benefit.

C. DBW becomes more negative over core life.

D. Correct. The reactor is not shutdown, as indicated by power stable at 4%. All groups have already de-energized so the correct immediate action would be to initiate emergency boration. At beginning of life, DBW is less negative.

OPS 5-96, Obj. 2; OPS 1-48, Obj. 24; OPS 1-48 Table 2; EOP-2 Step 2.3; EOP-TBD cross-step document for EOP-2 Step 2.2 and 2.3

RO - New

Reference(s) provided: None

27. 033K3.03 001/2/2/RO#27/C/A 3.0/3.3/NEW/R/CR03701/

The following plant conditions exist:

- Plant is in Mode 5 following a refueling outage.
- 480V ES Bus 3B is tagged out for planned maintenance.
- A ground fault causes a loss of 480V ES Bus 3A.

Which ONE of the following represents the effect of this failure over the next hour and the reason for that effect?

A. RCS temperature will rise due to the DHHE temperature control failing to minimum cooling.

B. RCS temperature will rise due to the trip of DHP-1A.

C. Spent Fuel Pool temperature will rise due to the loss of DC cooling to the SF heat exchangers.

D.✓ Spent Fuel Pool temperature will rise due to the loss of SFP-1A.

Reasons:

A. RCS temperature may rise but not because the temperature contoller has failed.

B. RCS temperature may rise, but it will be due to the loss of DCP-1A, not DHP-1A (which is powered from 4160V ES Bus 3A).

C. The spent fuel cooling system is cooled by SW, not DC.

D. Correct. SFP-1A is powered from ES MCC 3A1, which is powered from 480V ES Bus 3A. Once SFP circulation is lost, temperature will rise.

OPS 4-29, Obj. 6; OPS 4-29 Section 1-2.0.F & 1-4.0.B.6

RO - New

Reference(s) provided: None

28. 034G2.4.31 001/2/2/RO#28/C/A 3.3/3.4/NEW/R/CR03701/
The following plant conditions exist:

- The plant has been in Mode 6 for 3 weeks.
- Fuel movement is in progress.
- Annunciators H-02-01 "Atmospheric Radiation High" and H-02-02 "Atmospheric Monitor Warning" are received.
- Investigation reveals that the RM-A1 Gas channel is in high alarm.

Which ONE of the following describes the appropriate response to this alarm?

A. Ensure RB purge or mini-purge is in progress using OP-417 "Containment Operating Procedure."

B.✓ Ensure RB purge or mini-purge is in progress using AP-250 "Radiation Monitor Actuation."

C. Ensure any RB purge is secured using OP-417 "Containment Operating Procedure."

D. Ensure any RB purge is secured using AP-250 "Radiation Monitor Actuation."

Reasons:

A. Plausible since OP-417 would be the normal procedure for starting a RB purge.

B. Correct. AR-403 EP1712 directs referring to AP-250 for a valid alarm. AP-250 Entry Conditions are met with RM-A1 Gas in high alarm. Enclosure 1 directs that with the reactor shutdown greater than 72 hours RB purge or mini-purge should be ensured to be in service. The steps to perform this are contained within AP-250.

C. Plausible since AP-250 would direct securing the RB purge if less than 72 hours had elapesd since reactor shutdown. Also plausible since OP-417 would be the normal procedure for securing a RB purge.

D. Plausible since AP-250 would direct securing the RB purge if less than 72 hours had elapesd since reactor shutdown.

OPS 5-60, Obj. 4,7; AP-250 Enclosure 1; AR-403 EP 1712

RO - New

Reference(s) provided: None

29. 035K6.03 001/2/2/RO#29/C/A 2.6/3.0/NEW/R/CR03701/
The following plant conditions exist:

- Plant is at 100% power.
- 'A' OTSG Operating Level transmitter (SP-1A-LT2) fails high.
- The pen for 'A' OTSG on SP-1A-LIR1 remains constant.

Assuming no operator actions are taken actual 'A' OTSG level will:

A. lower, but stabilize at approximately 30".

B. lower, and remain offscale low.

C.✔ remain constant because the non-selected transmitter failed high.

D. remain constant because this instrument cannot provide high level control.

Reasons:

A. This would be correct if the selected instrument failed high. Since the LIR on the MCB is constant, it can be determined that the failing instrument is the non-selected instrument.

B. Level will not lower since the non-selected instrument is failing.

C. Correct. The selected instrument is displayed on the recorder. Since the recorder is not moving ICS is still receiving a good level signal.

D. Plausible since different instrument ranges do provide different control functions. However, the Operating Level instruments do provide the high level (overfill) control function, when selected.

OPS 4-14, Obj. 4 & 7; OPS 4-14 Section 1-4.0.H.12; OPS 4-32 Section 1-5.0.A.1.c); OPS 4-09 Section 1-4.0.A; OP-501

RO - New

Reference(s) provided: None

30. 038EK3.06 001/1/1/RO#30/MEM 4.2/4.5/NEW/R/CR03701/

A step in EOP-6 "Steam Generator Tube Rupture" directs the operator to concurrently perform EOP-14, Enclosure 7, EFWP Management if EFW is required but no EFWPs are running.

For EOP-6, which ONE of the following choices represents the **least** preferred pump and the reason it is least preferred?

A.✔ EFP-2, because it can cause an undesirable cooldown at low decay heat.

B. EFP-1, because it is not safety related and has no auto-start capability.

C. FWP-7, because it is not safety related and lacks a safety related power supply.

D. FWP-7, because it has no auto-start and requires manual flow control.

Reasons:

A. Correct. Per the EOP-TBD cross-step document for EOP-6, EFP-2 is preferred only as a last resort since it can cause an undesirable cooldown at low decay heat rates.

B. Plausible since EFP-1 is not safety related, but it is listed in the basis document and has automatic flow control.

C. Plausible since FWP-7 is not safety related, but it is listed in the basis document as the third preferred pump since it has an independent power source.

D. Plausible because FWP-7 does not have an auto-start and does not have automatic flow control. However, it is listed as the third preferred pump because it has an independent power source.

OPS 5-101, Obj. 3; EOP-TBD Cross-step document for EOP-6 Step 3.41; OPS 4-37 Step 1-4.0.L

RO - New

Reference(s) provided: None

31. 039A4.04 001/2/1/RO#31/MEM 3.8/3.9/NEW/R/CR03701/

Which ONE of the following conditions would NOT cause the "EF Pump 2 Out of Service" alarm?

A.✔ ASV-204 closed with DC control power un-available.

B. ASV-5 closed with DC control power un-available.

C. MSV-56 closed.

D. MSV-55 closed.

Reasons:

A. Correct. ASV-204 closed (either with or without DC control power) will not cause an EFP-2 Out of Service alarm.

B. ASV-5 is a normally closed valve. However, with a loss of DC control power (i.e. the valve will not automatically open) the EFP-2 Out of Service alarm will be in.

C. MSV-56 is a normally open valve. Whenever it is closed the EFP-2 Out of Service alarm will be in.

D. MSV-55 is a normally open valve. Whenever it is closed the EFP-2 Out of Service alarm will be in.

OPS 4-37, Obj. 3; OPS 4-37 Section 1-4.0.E; AR-403 Window H-07-05

RO - New

Reference(s) provided: None

32. 039K5.05 001/2/1/RO#32/C/A 2.7/3.1/NEW/R/CR03701/

The following plant conditions exist:

- A 75 gpm tube leak has occurred on the 'B' OTSG.
- During the power reduction, a loss of offsite power and reactor trip occurred.
- RCS pressure is 1950 psig and rising slowly.
- RCS temperature is 555°F.

The CRS directs a cooldown be commenced per EOP-6. The cooldown should be established using ___(1)___ and the most limiting component for the specified cooldown rate limit is the ___(2)___.

A. (1) Turbine Bypass Valves
(2) reactor vessel closure head

B. (1) Turbine Bypass Valves
(2) reactor vessel beltline

C. (1) Atmospheric Dump Valves
(2) reactor vessel closure head

D.✔ (1) Atmospheric Dump Valves
(2) reactor vessel beltline

Reasons:

A. Plausible since the TBVs would normally be preferred during a tube rupture and in the first 8 EFPY this might be the limiting component.

B. Plausible since the TBVs would normally be preferred during a tube rupture.

C. Plausible since in the first 8 EFPY this might be the limiting component.

D. Correct. With the loss of offsite power all CWPs have been lost. As a result, the TBVs are not available and the ADVs would be used. While this event does give an existing tube leak, the cooldown rates in this event are no more limiting than any other situation. All normal cooldown rates (since ~ 8 EFPY) are based on the reactor vessel beltline region due to neutron embrittlement.

OPS 4-66, Obj. 8; OPS 4-66 Sections 1-4.0.A.2 & 1-4.0.E.6; ITS 3.4.3 Basis

RO - New

Reference(s) provided: None

33. 041G2.4.35 001/2/2/RO#33/MEM 3.3/3.5/NEW/R/CR03701/

A step in EOP-12, Station Blackout, states:

ACTION: Align backup air supply to ADVs.

DETAIL: Notify SPO to open IAV-676 "ADV BACKUP AIR SUPPLY ISO".

IAV-676 is located on the ___(1)___ and must be opened to provide backup air to ensure the ___(2)___ hour SBO **coping** requirement is met.

A.✔ (1) 119' turbine building
(2) four

B. (1) 119' turbine building
(2) two

C. (1) 95' turbine building
(2) four

D. (1) 95' turbine building
(2) two

Reasons:

A. Correct. While the air bottles are located on the 95' elevation, the valve is located on the 119'. The SBO coping requirement is 4 hours.

B. Plausible since, with no operator actions, the batteries are required to last at least 2 hours.

C. While the air bottles are located on the 95', IAV-676 is located on the 119'.

D. Plausible since, with no operator actions, the batteries are required to last at least 2 hours. IAV-676 is located on the 119' TB.

OPS 4-66, Obj. 2 & 3; OPS 4-66 Section 1-4.0.A.6; EOP-12 Step 3.5; DBD 6/10.

RO - New

Reference(s) provided: None

34. 045K1.18 001/2/2/RO#34/C/A 3.6/3.7/NEW/R/CR03701/

Reactor power is 70% when the A MFWP trips. During the transient the following parameters are noted:

- Rx Power 55%
- RCS Pressure 2250 psig
- Main Condenser Vacuum 6" HgA
- Autostop Oil Pressure 40 psig

Which ONE of the following represents the procedure that should be in use?

A. AP-510 Rapid Power Reduction

B. AP-545 Plant Runback

C. AP-660 Turbine Trip

D.✔ EOP-2 Vital System Status Verification

Reasons:

A. While a rapid power reduction may be useful during degrading turbine conditions to reduce power to <45%, conditions have already degraded such that a Rx trip is necessary.

B. While this procedure would have been in effect following the MFWP trip, it would now be superceded by EOP-2.

C. If Rx power were less than 45%, the turbine could be tripped without a Rx trip. However, Rx power is 55% so a Rx trip is necessary.

D. Correct. With autostop oil pressure < 45 psig and Rx power > 45% a Rx trip should have occurred and EOP-2 would be applicable.

OPS 4-12, Obj. 4; OPS 4-12 Section 2-13.0 Table 1

RO - New

Reference(s) provided: None

35. 054AA1.03 001/1/1/RO#35/C/A 3.5/3.7/NEW/R/CR03701/

The following plant conditions exist:

- A TS required shutdown is in progress due to both SWP-1A and SWP-1B inoperable and unavailable.
- At 50% power, the B MFWP was secured for governor maintenance.
- A tagging error caused a loss of the A MFWP and subsequent plant trip.
- On the plant trip, a Loss of Offsite Power occurred.

Which ONE of the following represents a list of components that are available based on the above conditions:

A. MUP-1A and EFP-1

B. MUP-1B and EFP-2

C. MUP-1B and EFP-1

D.✓ MUP-1A and EFP-2

Reasons:

With the LOOP, power is lost to SWP-1C. Since both SWP-1A and SWP-1B are already unavailable, a total loss of SW has occurred.

A. MUP-1A can be cooled by DC and would be available. EFP-1 is SW cooled, and would not be available.

B. MUP-1B cooling can only be provided by SW, so it would be unavailable. EFP-2 oil cooling is provided by EFW flow from its own discharge.

C. MUP-1B can only be cooled by SW. EFP-1 motor and gear unit oil are cooled by SW. Both would be unavailable.

D. Correct. MUP-1A is normally cooled by SW, but can be cooled by DC. EFP-2 oil cooling is provided by EFW from its own discharge.

OPS 4-56, Obj. 8; OPS 4-56 Section 1-6.0; OPS 4-37 Section 1-4.0.D; OPS 4-52 Section 1-4.0.S.5

RO - New

Reference(s) provided: None

36. 055EA2.01 001/1/1/RO#36/MEM 3.4/3.7/NEW/R/CR03701/

The plant has experienced a Station Blackout and a loss of all instrument and station air. Which ONE of the following describes the effect on MUV-49 (Letdown Isolation) and MUV-51 (Letdown Orifice Bypass)?

	MUV-49	MUV-51
A.	closed	closed
B.	open	closed
C.✔	closed	as-is
D.	open	as-is

Reasons:

Various valves in the makeup system are designed with an air failure protection system. These valves are equipped with solenoid valves that de-energize on a loss of system header pressure to lock in the remaining air to hold the valve in as-is.

A. MUV-51 is air to open, but it is equipped with an air failure protection solenoid. It will remain as-is.

B. MUV-49 will fail closed. MUV-51 is air to open, but it is equipped with an air failure protection solenoid.

C. Correct. MUV-49 will fail closed on a loss of air. MUV-51 is equipped with an air failure protection solenoid (de-energized at 32 psig) which will maintain the valve as-is.

D. MUV-49 will fail closed.

OPS 4-52, Obj. 3 & 7; OPS 4-52 Section 1-4.0.E & G; OP-411 Enclosure 7

RO - New

Reference(s) provided: None

37. 056AK3.02 001/1/1/RO#37/MEM 4.4/4.7/BANK/R/CR03701/ROT-5-091-035

EOP-14, Enclosure 14 (Main Generator Purging) directs the SPO to purge the Main Generator with nitrogen. What is the reason, IAW EOP-14 TBD, that nitrogen is used instead of the normal source, carbon dioxide?

A. The Main Generator can be purged faster using nitrogen. This allows the purge to be completed before depletion of the Non-1E battery.

B. The nitrogen tanks are further from the Main Generator than the carbon dioxide tank. This prevents ice migration from the nitrogen tanks to the Main Generator.

C.✔ The power supply to the carbon dioxide Hex Vaporizer will not be available during a LOOP. The nitrogen tank Vaporizer requires no power.

D. The power supply to the carbon dioxide Hex Vaporizer will not be available during a LOOP. The nitrogen tank Vaporizer can be supplied by EGDG-1C.

Reasons:

A. Plausible since the pressure reducer for CO2 regulates at 35 psig while the N2 header is maintained at 100 psig. Also, preventing the depletion of the Non-1E battery is the primary reason for performing this enclosure. However, the rate of purge is not the reason for the step.

B. Plausible since the N2 tanks are further away than the CO2 tank. Also, the vaporizers are needed to prevent ice migration to the Main Generator. However, distance from the Main Generator is not a factor.

C. Correct. During a LOOP, the CO2 hex vaporizer will be unavailable. The N2 system vaporizer uses heat transfer to atmosphere, so it will be available following a LOOP. To prevent ice intrusion in the main generator, the N2 system is used during LOOP conditions to perform the generator purge.

D. Plausible since the CO2 hex vaporizer will not be available during a LOOP. Incorrect because the nitrogen vaporizer requires no power.

OPS 5-116, Obj. 2; OPS 5-91, Obj. 1; OPS 4-82, Obj. 9; OPS ; EOP-TBD cross-step document for EOP-14 Step 14.4

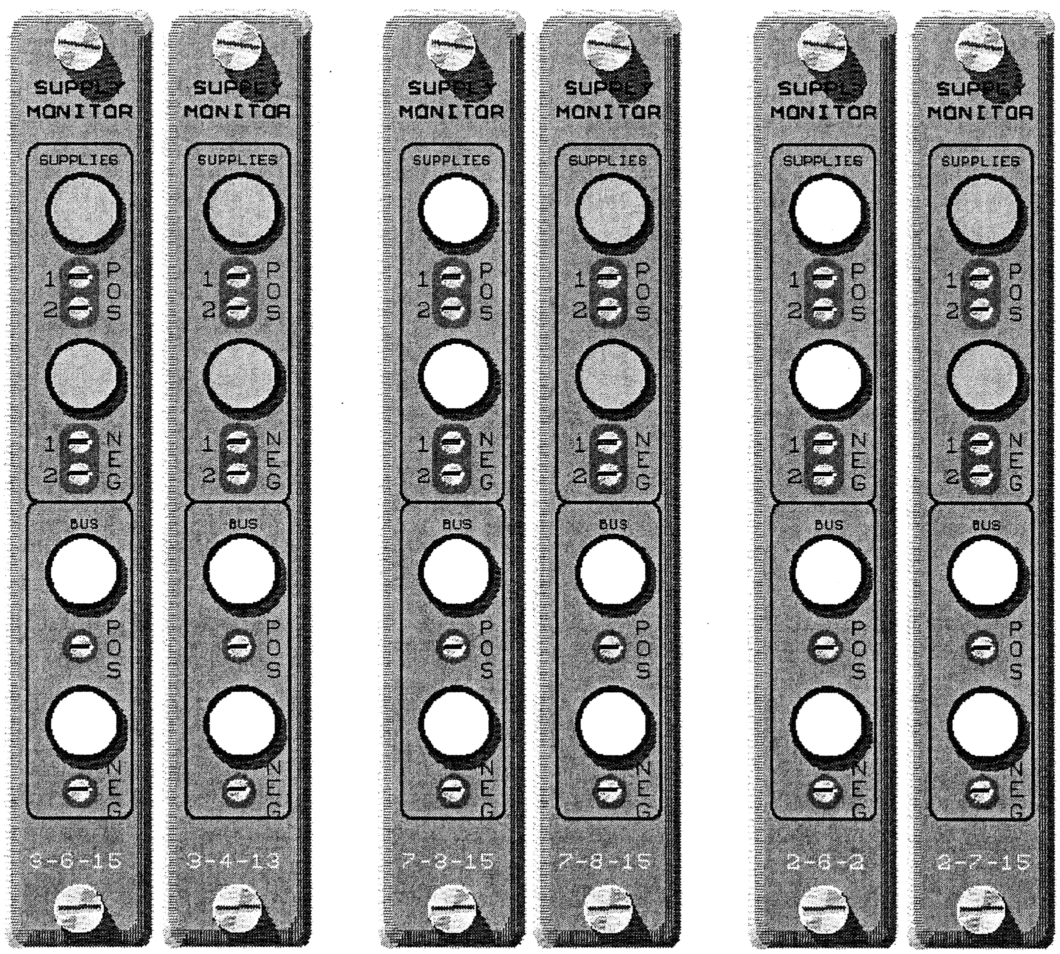
RO - Bank

Reference(s) provided: None

38. 057AA1.04 001/1/1/RO#38/C/A 3.5/3.6/NEW/R/CR03701/

With the plant operating at 100% power, an electrical transient occurs. The following indications are observed on the NNI and ICS Power Supply Monitors. What is the status of PZR level control valve MUV-31(assume no operator actions)? [WHITE INDICATES LIGHT IS ON]

NNI-X **NNI-Y** **ICS-POWER**



A. Failed closed

B. Failed as-is

C. Automatic control failed, but manual available.

D.✓ Both manual and automatic control available.

Reasons:

A. Plausible since this would be a normally expected failure mechanism for this type of valve.

B. Plausible since this would represent a possible failure mechanism (i.e. both manual and automatic control lost).

C. Plausible since this would be the failure mechanism on a loss of NNI-X DC power.

D. Correct. This condition represents a failure of VBDP-1 (one of two power supplies to NNI-X. In this case, NNI-X would remain powered and MUV-31 would have both automatic and manual control available.

OPS 4-09, Obj. 3; OPS 4-52, Obj. 3, 7; OPS 4-09 Section 1-4.0.I.6; OPS 4-52 Section 1-4.0.X

RO - New

Reference(s) provided: None

39. 059A1.03 001/2/1/RO#39/C/A 2.7/2.9/NEW/R/CR03701/

The following plant conditions exist:

- Plant is at 80% power.
- FWV-2 (B Main Feedwater Booster Pump Suction Valve) open limit switch fails such that the valve no longer indicates full open.

Which ONE of the following represents required actions and/or verifications for the above plant conditions?

A. Maintain plant power at 80%.

B. Reduce power to 60% to 75% and monitor the Main Feedwater Pumps for signs of cavitation.

C.✔ Trip one Main Feedwater Pump and ensure the plant runs back to $\leq$ 52%.

D. Verify the B Main Feedwater Pump has automatically tripped and ensure the plant runs back to $\leq$ 52%.

Reasons:

A. While a work request would be a good action to take, it would not be acceptable to maintain power at 80%.

B. The limit & precaution mentions a concern for possible cavitation with only one booster pump with power between 60% and 75%. However, with a trip of a booster pump above 75% power one MFWP must be tripped. Also a power reduction to 52% power is required.

C. Correct. With the failure indicated the B MFW Booster Pump would trip. Per Limit and Precaution 3.2.1, if one booster pump trips while > 75% power one MFWP must be tripped. Also, with a loss of either MFWP or MFWBP a runback to 52% is expected.

D. There is no automatic trip of a MFWP on a loss of a MFW Booster Pump.

OPS 4-68, Obj. 1-3, 1-5, 1-7; OPS 4-68 Section 1-4.0.B.4; OP-0605 Step 3.2.1

RO - New

Reference(s) provided: None

40. 059K4.19 001/2/1/RO#40/MEM 3.2/3.4/BANK/R/CR03701/ROT-4-068-016
Which ONE of the following lists of Main Feedwater valves receive a close command from a Main Feedwater Isolation signal?

A.	Both main block valves	FWV-29 & 30
	Both startup control valves	FWV-39 & 40
	Both low load control valves	FWV-37 & 38
	Both MFWP suction valves	FWV-14 & 15
B.	Both main block valves	FWV-29 & 30
	Both startup block valves	FWV-33 & 36
	Both low load block valves	FWV-31 & 32
	Both MFWP discharge valves	FWV-22 & 23
C.✔	Both main block valves	FWV-29 & 30
	Both startup block valves	FWV-33 & 36
	Both low load block valves	FWV-31 & 32
	Both MFWP suction valves	FWV-14 & 15
D.	Both emergency block valves	FWV-34 & 35
	Both startup block valves	FWV-33 & 36
	Both low load block valves	FWV-31 & 32
	Both MFWP suction valves	FWV-14 & 15

Reasons:

A. SUCV's and LLCV's (FWV-39, 40, 37, & 38) do not get a FWI signal.

B. MFWP discharge valves (FWV-22 & 23) do not get a FWI signal.

C. Correct. All the valves listed get FWI signal.

D. Emergency Block Valves (FWV-34 & 35) do not get a FWI signal.

OPS 4-68, Obj. 1-4; OPS 4-68 Section 1-9.0.A.3

RO - Bank

Reference(s) provided: None

41. 061AA1.01 001/1/2/RO#41/MEM 3.6/3.6/BANK/R/CR03701/5-060-002
The plant is in a refueling outage with fuel movement in progress. The Fuel Handling Building (Spent Fuel floor) ventilation duct radiation monitor, RM-A4, goes in to high alarm. Assuming all automatic actions occur correctly and no manual actions are taken, which of the following would correctly describe the effect on the plant ventilation?

A. No effect. There are no automatic actions associated with RM-A4.

B. The Auxiliary Building supply fans, AHF-11A and AHF-11B, would trip.

C.✔ The Fuel Handling Area supply fan, AHF-10 would trip.

D. The running Auxiliary Building exhaust fans, either AHF-14A and AHF-14C OR AHF-14B and AHF-14D, would trip.

Reasons:

A. RM-A4 has an automatic action, AHF-10 will trip.

B. Other radiation monitors, not RM-A4, trip AHF-11A and AHF-11B.

C. Correct, RM-A4 in high alarm will trip AHF-10.

D. Auxiliary Building exhaust fans are not tripped by any radiation monitor, they also exhaust the Spent Fuel floor.

OPS 5-60, Obj. 8; OPS 4-25, Obj. 4; AP-250 Table 1; OPS 4-25 Section 1-4.0.F.5.e

RO - Bank

Reference(s) provided: None

42. 061K1.10 001/2/1/RO#42/MEM 2.6/2.7/NEW/R/CR03701/

Which ONE of the following describes the fuel supply for Diesel Driven EFW Pump EFP-3? Fuel can be supplied via pumps that are driven by:

A. a DC motor only.

B.✔ a DC motor and the engine.

C. an AC motor and the engine.

D. an AC motor and a DC motor.

Reasons:

A. An air motor initially starts the engine but does not supply fuel oil.

B. Correct. On startup the DC motor and engine driven motor supply fuel oil to the engine. When 400 rpm is reached the DC motor is automatically stopped.

C. The diesel has multiple AC motors, but not an AC fuel oil motor.

D. The diesel has multiple AC motors, but not an AC fuel oil motor.

OPS 4-37, Obj. 3; OPS 4-37 Section 1-4.0.K.13 & Figure 6

RO - New

Reference(s) provided: None

43. 062A2.12 001/2/1/RO#43/C/A 3.2/3.6/NEW/R/CR03701/
The following plant conditions exist:

- The plant has experienced a loss of the A ES 4160V Bus.
- Annunciator Q-02-03, 4160V ES BUS A UV LOCKOUT ACT, is in alarm.
- Electricians have reported that there is no fault on the "A" 4160V ES bus.
- The Offsite Power Transformer is now available.

Which of the following describes the required actions for MUV-49 and the procedure actions required to allow closure of Breaker 3211, "A" Offsite Power Transformer 4160V ES Bus Supply Breaker, and energize the "A" ES 4160V ES Bus?

A. MUV-49 should remain open.
Open the AY Knife Switch, depress and release the "4160V ESA UV Reset" pushbutton, and reclose the AY Knife Switch.

B.✓ MUV-49 must be closed.
Open the AY Knife Switch, depress and release the "4160V ESA UV Reset" pushbutton, and reclose the AY Knife Switch.

C. MUV-49 should remain open.
Depress and hold the "4160V ESA UV Reset" pushbutton until the 4160V ES BUS A UV LOCKOUT ACT alarm clears. The AY Knife Switch does not need to be operated.

D. MUV-49 must be closed.
Depress and hold the "4160V ESA UV Reset" pushbutton until the 4160V ES BUS A UV LOCKOUT ACT alarm clears. The AY Knife Switch does not need to be operated.

Reasons:

A. See discussion for B below.

B. Correct. The A Demin is the normal in-service demin. With a loss of the A ES Bus letdown would have been isolated. AP-770 has a step that requires MUV-49 be closed if a letdown flow path does not exist. This is the correct action for restoring power with a bus lockout per step 3.13 of AP-770.

C. See discussion for B above. The UV relays require ~ 7.8 seconds to physically reset.

D. See discussion for B above. The UV relays require ~ 7.8 seconds to physically reset.

OPS-4-91 Section 1-4.0.E; OPS-4-91 Obj. 6

RO - New

Reference(s) provided: None

44. 062AA2.04 001/1/1/RO#44/C/A 2.5/2.9/BANK/R/CR03701/5-061-002

The following plant conditions exist:

- SW-RW flow is significantly reduced due to heat exchanger blockage
- SWP-1C is in service
- RCP SW return temperatures:
  RCP-1A - 163°F
  RCP-1B - 170°F
  RCP-1C - 181°F
  RCP-1D - 168°F
- CRDM stator temperatures:
  ROD 2-1 160°F
  ROD 2-3 165°F
  ROD 3-4 162°F
  ROD 3-5 173°F
  ROD 4-3 182°F
  ROD 4-7 175°F
  ROD 5-2 167°F
  ROD 6-2 153°F
  ROD 6-5 181°F
  ROD 7-4 177°F

Which ONE of the following describes the action(s) required to be taken?

A. Reduce power and shut down RCP-1C.

B. Reduce power and de-energize ROD 4-3 and ROD 6-5.

C. Start SWP-1A and trip SWP-1C.

D.✓ Trip the reactor.

Reasons:

A. Plausible since RCP-1C should be secured per OP-302. However, with more than 1 CRD > 180°F, a reactor trip is required, not a power reduction.

B. More than 1 CRD has a high motor temperature which would require a reactor trip.

C. Plausible since SWP-1A would provide more cooling flow than SWP-1C. However, with SW-RW degraded the SW system lacks an adequate heat sink. Raising SW flow would have no real impact on heat removal from the SW system.

D. Correct. Per AP-330 the reactor must be tripped with more than one CRD with temperature > 180°F.

OPS 5-61, Obj. 5; OP-502 Step 4.15.5 / AP-330 Step 3.3

RO - Bank

Reference(s) provided: None

45. 063K3.01 001/2/1/RO#45/C/A 3.7/4.1/BANK/R/CR03701/4-006-019
What effect will the loss of DPDP-5A have on the "A" Emergency Diesel Generator, EGDG-1A?

EGDG-1A will:

A. immediately start and go to 900 rpm with proper voltage and frequency.

B.✔ immediately start and go to 900 rpm with no indication of voltage.

C. remain in a standby condition. If an undervoltage condition occurs EGDG-1A will start and energize the bus.

D. remain in a standby condition. If an undervoltage condition occurs EGDG-1A will start, but will *not* energize the bus.

Reasons:

A. The diesel will start but will have no DC power to flash the field.

B. Correct. Loss of DPDP-6A, breaker 12 will start diesel.

C. Generator differential current relays are not functional with the loss of DPDP-6A, breaker 14.

D. Undervoltage relays are defeated with the loss of DPDP-5A, breaker 10.

OPS 4-06, Obj. 1-4 & 1-7; OPS 4-06 Section 1-4.0.L.3.; OP-700E

RO - Bank

Reference(s) provided: None

46. 064A2.02 001/2/1/RO#46/C/A 2.7/2.9/NEW/R/CR03701/

EGDG-1B is being operated in parallel with the grid per SP-354B with a load of 2700 KW and 1.2 MVAR out. A grid disturbance occurs. Following the grid disturbance diesel load is 2700 KW and 2.5 MVAR out. Post-disturbance loading is ____(1)____ and the component that would be used (per SP-354B) to adjust MVAR loading in this mode of diesel operation is the ____(2)____.

A. (1) not acceptable
(2) local B EDG VOLTAGE ADJUST rheostat

B. (1) acceptable
(2) local B EDG VOLTAGE ADJUST rheostat

C.✔ (1) not acceptable
(2) EDG B EXC VOLT ADJUST rheostat

D. (1) acceptable
(2) EDG B EXC VOLT ADJUST rheostat

Reasons:

A. Plausible since during normal operations the EDG is aligned such that the local control would be selected. Also, later in this procedure the local control is used to adjust voltage.

B. The MVAR limit per SP-354B is 1.5. Plausible since during normal operations the EDG is aligned such that the local control would be selected. Also, later in this procedure the local control is used to adjust voltage.

C. Correct. The MVAR limit per SP-354B is 1.5. In this portion of the procedure, voltage adjustments are made using the EDG B EXC VOLT ADJUST rheostat.

D. The MVAR limit per SP-354B is 1.5.

OPS 4-06, Obj. 1-4 & 1-7; OPS 2-16, Obj. 44; OPS 4-06 Section 1-4.0.L.6.; OPS 2-16 1-7.0.O.2; SP-354B

RO - New

Reference(s) provided: None

47. 064K6.07 001/2/1/RO#47/C/A 2.7/2.9/MOD/R/CR03701/4-006-009

Maintenance workers in the "A" Diesel Generator Control Room accidentally damaged the relief valve on one of the air receivers causing it to fail partially open. The air compressor has started and is maintaining pressure in the receivers at 175 psig. If an undervoltage condition were to occur at this time, which of the following describes the response of the EDG and required operator action, if any?

A. EDG will not start under these conditions. Isolate the affected receiver and open the crosstie valves to the station air system.

B. EDG will not start under these conditions. Isolate the affected receiver and open the crosstie valves to the "B" side air receivers.

C. EDG will not start under these conditions. Isolate the relief valve and allow air pressure to recover sufficiently to start the diesel.

D.✓ EDG will start.

Reasons:

A. EDG will start. The receivers do not have a crosstie with station air. However, station air is supplied to the compressor unloader valve.

B. EDG will start. These actions would align air to the "A" Diesel.

C. EDG will start. The relief valve cannot be isolated.

D. Correct. The minimum starting air pressure is 150 psig (single start).

OPS 4-06, Obj. 1-3 & 1-7; OPS 4-06 Section 1-4.0.D.2.b); EDBD Tab 6/15, Section 3.5

RO - Bank

Reference(s) provided: None

48. 072K1.04 001/2/2/RO#48/MEM 3.3/3.5/BANK/R/CR03701/4-087-004

Which ONE of the following conditions will send a trip signal to the control complex normal duty supply fans (AHF-17A/B)?

A. Toxic gas actuation.

B.✓ RM-A5 Gas actuation.

C. 4 psi Engineered Safeguards actuation.

D. Placing a Control Complex Isolate/Reset switch in "Isolate".

Reasons:

A. Toxic gas actuation has been removed.

B. Correct. The running 17 and 19 fans will trip.

C. The RBIC signal will shift the damper into the recirc lineup but will not trip the fans.

D. This switch will only realign dampers, not trip fans.

OPS 4-87, Obj. 4; OPS 4-87 Section 1-3.0.F

RO - Bank

Reference(s) provided: None

49. 073A1.01 001/2/1/RO#49/C/A 3.2/3.5/MOD/R/CR03701/4-025-012
The following plant conditions exist:

- The plant has been tripped for 30 minutes; no cooldown is in progress.
- Pressurizer level is lowering.
- The makeup valve to the pressurizer, MUV-31, is 100% open.
- Makeup tank level is lowering.
- Reactor Building (RB) pressure is 0.5 psig and steady.
- The "A" OTSG is at low level limits.
- The "B" OTSG is at 50 inches and rising.
- Both OTSGs have a pressure of 1010 psig.

Which of the following sets of radiation monitor indications would be indicative of the above conditions? RM-G26 is the "B" MS line monitor and RM-G28 is the "B" MS line release (ADV) monitor.

A. RM-G26 rising
RM-G28 rising

B.✔ RM-G26 steady
RM-G28 steady

C. RM-G26 rising
RM-G28 steady

D. RM-G26 steady
RM-G28 rising

Reasons:

A. RM-G26 is an N16 monitor. 30 minutes after a trip there will be no N16 left to monitor.

B. Correct. RM-G26 is an N16 monitor. 30 minutes after a trip there will be no N16 left to monitor. With pressure at 1010 psig the ADVs will not be open so there is no steam flow past RM-G28.

C. RM-G26 is an N16 monitor. 30 minutes after a trip there will be no N16 left to monitor.

D. With pressure at 1010 psig the ADVs will not be open so there is no steam flow past RM-G28.

OPS 4-25, Obj. 3; OPS 4-25 Sections 1-4.0.C & D; OPS 3-24 Section 1-6.0.A

RO - Modified

Reference(s) provided: None

50. 073A4.03 001/2/1/RO#50/MEM 3.1/3.2/NEW/R/CR03701/
Which ONE of the following represents the effect of depressing the "CHECK SOURCE" button on RM-L2 and the reason for having a check source?

Pressing this button ___(1)___. A check source is used to ___(2)___.:

A.✔ (1) exposes the detector to a known radioactive substance
(2) verify proper monitor response

B. (1) injects an electronic signal downstream of the detector
(2) verify proper monitor response

C. (1) exposes the detector to a known radioactive substance
(2) provide a signal for monitor calibration

D. (1) injects an electronic signal downstream of the detector
(2) provide a signal for monitor calibration

Reasons:

A. Correct. The RM-Ls are equipped with radioactive sources for source check. The purpose of the check source is to verify proper monitor and detector operation.

B. Plausible since some RM-Gs have electronic check sources. RM-L2 is equipped with an actual radioactive source.

C. RM-L2 is calibrated using an external source using CHE-220R.

D. Plausible since some RM-Gs have electronic check sources. RM-L2 is equipped with an actual radioactive source. RM-L2 is calibrated using an external source using CHE-220R.

OPS 4-25, Obj. 3 & 4; OPS 4-25 Section 1-4.0.G.

RO - New

Reference(s) provided: None

51. 074EK3.04 001/1/2/RO#51/MEM 3.9/4.2/NEW/R/CR03701/

EOP-7, Inadequate Core Cooling, contains a step that requires stopping all RCPs once Tincore reaches the Severe Accident Region.

Which ONE of the following is the reason for this step in accordance with the EOP-7 TBD?

A.✔ Off site dose may rise due to thermally induced OTSG tube failures.

B. HPI cooldown is the preferred cooldown method once the Severe Accident Region is reached.

C. RCPs are of little use once the Severe Accident Region is reached so the pumps are secured to prevent further pump damage.

D. The additional pump heat input to the RCS retards the cooldown rate that is trying to be achieved.

Reasons:

A. Correct. This is the reason for performing this step, per the EOP-TBD cross-step document for EOP-7.

B. Plausible since the previous step in the EOP directs branching to EOP-8B, HPI Cooldown.

C. Plausible since pump damage is certainly occurring in the steam atmosphere.

D. Plausible since the RCPs add about 20 MWthermal heat load to the RCS.

OPS 5-97, Obj. 3; EOP-TBD Cross-Step document for EOP-7

RO - New

Reference(s) provided: None

52. 075K1.01 001/2/2/RO#52/MEM 2.5/2.5/BANK/R/CR03701/ROT-4-075-006

If the Nuclear Services Intake Screen (CWTS-2) becomes clogged with debris from the intake which of the following pump's suction will be affected?

A. RWP-1, RWP-2A & RWP-3A

B. CWP-1A, CWP-1B, CWP-1C & CWP-1D

C. CWP-1B, CWP-1D, RWP-1, RWP-2B & RWP-3B.

D.✓ RWP-1, RWP-2B & RWP-3B (CWP-1B & CWP-1D are not affected)

Reasons:

A. While RWP-1 draws suction from a separate intake via CWTS-2, RWP-2A and 3A draw suction from the forebay area which is supplied via CWTS-1A thru 1G.

B. The CWPs draw suction from the forebay area which is supplied via CWTS-1A thru 1G.

C. While RWP-1, 2B, and 3B draw suction from a separate intake via CWTS-2, CWP-1B and 1D draw suction from the forebay area which is supplied via CWTS-1A thru 1G.

D. Correct. RWP-1, RWP-2B, and RWP-3B all draw suction from a separate intake via CWTS-2.

OPS 4-75, Obj. 4-2; OPS 4-75 Section 4-2.0.B, OPS 4-57 Section 1-3.0.A & B

RO - Bank

Reference(s) provided: None

53. 076AG2.2.22 001/1/2/RO#53/C/A 3.4/4.1/MOD/R/CR03701/5-078-002

The following plant conditions exist:

- The plant is operating at 100% reactor power.
- RCS Dose Equivalent I-131 (DEI) is 110 μCi/gm.

Which ONE of the following statements describes the required actions for this condition?
(Reference Included)

A. Maintain current power, verify DEI is within the acceptable region and restore DEI to within limits in 48 hours.

B. Reduce power to 70%, verify DEI is within the acceptable region and restore DEI to within limits in 48 hours.

C.✔ Shut down the plant and be in Mode 3 with Tave less than 500° F within 6 hours unless the DEI concentration returns to the acceptable region.

D. Perform SR 3.4.15.2 within 4 hours and be in Mode 3 with Tave less than 500° F within 6 hours.

Reasons:

A. This would be the applicable action if DEI were within the acceptable region. However, the value as given exceeds the acceptable region for 100% power.

B. This choice could be selected if the candidate mistakenly applied LCO 3.0.2. In this case, the reactor power level is not part of the Mode of applicability, but rather part of the graph. Even with power reduced, the LCO is still not met and it still remains applicable. Therefore, the required actions must be completed.

C. Correct. With DEI in the unacceptable region, the plant must be shutdown to Mode 3 with Tave less than 500° F within 6 hours per LCO 3.4.15 Required Action B.1. The plant shut down may be stopped if DEI concentration returns to the acceptable region of the curve.

D. This action would be required if gross specific activity was not within limits. No information is given which could lead to this conclusion.

OPS 5-78, Obj. 7; OPS 5-78 Section 1-4.0.J; TS 3.4.15

RO - Modified

Reference(s) provided: ITS 3.4.15

54. 076K4.02 001/2/1/RO#54/C/A 2.9/3.2/BANK/R/CR03701/4-057-002
The following plant conditions exist:

- Plant startup is in progress.
- Main Turbine is ready to roll.
- Backup ES Transformer is supplying the "A" ES bus.
- Offsite Power Transformer is supplying the "B" ES bus.
- A sudden pressure fault on the Startup transformer has just occurred.

Based on the above conditions which of the following Raw Water Pumps (RWPs), if any, would be in operation?

A. No RWPs would be operating.

B. Normal Duty RWP, RWP-1.

C. "A" Emergency Duty Nuclear Services RWP, RWP-2A.

D.✓ "B" Emergency Duty Nuclear Services RWP, RWP-2B.

Reasons:

A. RWP-2B will auto-start on low pressure.

B. RWP-1 is powered from the "A" Unit 4160V bus which is lost due to the Startup transformer failure.

C. There is no low pressure start for RWP-2A and no ES actuation has occurred and power has been lost to the A ES Bus.

D. Correct. "B" ES bus still has power. RWP-2B will start on low pressure.

OPS 4-57, Obj. 4; OPS 4-57 Section 1-4.0.C.5; OPS 4-88 Section 1-4.0.K.3; OP-408 Step 3.1.7

RO - Bank

Reference(s) provided: None

55. 078K1.04 001/2/1/RO#55/MEM 2.6/2.9/NEW/R/CR03701/

Which of the following automatic actions would be expected on a total loss of SC?

A. FWP-1A trip on high oil cooler temperature at 160°F.

B. FWP-2A trip on high oil cooler temperature at 180°F.

C. IAP-3A trip on high oil cooler temperature at 170°F.

D.✓ IAP-3A trip on high 2nd stage air temperature at 125°F.

Reasons:

A. Plausible since FWP-1A oil is cooled by SC. However, no high oil temperature trip exists.

B. Plausible since FWP-2A oil is cooled by SC. However, no high oil temperature trip exists.

C. Plausible since IAP-3A is cooled by SC and does have a high oil temperature trip. However, this trip is set at 180°F.

D. Correct. IAP-3A high air temperature trip (both 1st and 2nd stage) is set at 125°F.

OPS 4-81, Obj 2 & 3; OPS 4-81 Section 1-4.0.A.5

RO - New

Reference(s) provided: None

56. 078K2.01 001/2/1/RO#56/C/A 2.7/2.9/BANK/R/CR03701/4-081-004

A loss of offsite power has occurred causing a plant trip. The 230kv switchyard and 12kv line are de-energized. Both EDGs have started and are powering their respective ES 4160V busses. Prior to the loss of offsite power IAP-3C was in lead, IAP-3B was in first lag, IAP-3A was in second lag and IAP-4 was in auto. Shortly after the loss of offsite power the control board operator observed that instrument air pressure lowered to ≈83 psig and began to slowly recover. Which ONE of the following accurately states the status of the instrument air system?

A.✓ IAP-3C not running
IAP-3B not running
IAP-3A not running
IAP-4 running loaded
IADR-2 de-energized with both towers in service and purge valve closed

B. IAP-3C running loaded
IAP-3B running loaded
IAP-3A running loaded
IAP-4 running loaded
IADR-2 energized with only one tower in service

C. IAP-3C running loaded
IAP-3B not running
IAP-3A running loaded
IAP-4 running loaded
IADR-2 de-energized with both towers in service and purge valve closed

D. IAP-3C not running
IAP-3B not running
IAP-3A not running
IAP-4 running loaded
IADR-2 energized with only one tower in service

Reasons:

A. Correct. See reasons for 'B' below.

B. Incorrect due to IAP-3A,3B,3C have no power immediately following a LOOP concurrent with a loss of the 12kv line. IAP-3A powered from 480V Rx Aux. Bus 3A, IAP-3C powered from 480V Rx Aux. Bus 3B and IAP-3B powered from 480V Rx Aux. Bus 3B. Additionally IADR-2 would have both towers in service.

C. Same as 'A' above for air compressors.

D. IAV-647 would be open and IADR-2 would be de-energized with both towers in service.

OPS 4-81, Obj. 3; OPS 4-81 Section 1-4.0.A.2 & 1-4.0.H.7; OP-411 Steps 3.1.5, 3.1.6, 3.1.11 & 4.2.3

RO - Bank

Reference(s) provided: None

57. 103A4.06 001/2/1/RO#57/MEM 2.7/2.9/NEW/R/CR03701/
The plant is operating at 100% power with an RB entry planned for this shift. What remote indications are available that would indicate that the entry has started?

A. Security Central Alarm Station alarm only

B. MCB alarm only

C. MCB indicating lights and a Security Central Alarm Station alarm

D.✔ MCB indicating lights and a MCB alarm

Reasons:

A. There are no security alarms for the airlock doors.

B. Control Room indications consist of both an alarm and indicating lights.

C. There are no security alarms for the airlock doors.

D. Correct. Alarm PSA-X-06-08 "REACTOR BLDG PERSONNEL DOOR OPEN" and indicating lights on the RB Door Indication Panel on the PSA section of the MCB will indicate when either the inner or outer door are open.

OPS 4-63, Obj. 3 & 4; OPS 4-63 Section 1-8.0.A.2; AR-401 Window F-06-08

RO - New

Reference(s) provided: None

58. BW/A01AA2.2 001/1/2/RO#58/C/A 3.5/3.8/BANK/R/CR03701/4-014-003

The following plant conditions exist:

- The reactor is producing 1842 $MW_{thermal}$.
- Three reactor coolant pumps are operating.
- Control rod group 7 is 60% withdrawn.

Which of the following describes the ICS response, and required additional operator action(s), if any, if control rod 7-3 dropped fully into the core?

A. ICS will automatically run back to ≈ 54% ULD demand. Further action to manually lower reactor power is not required.

B. ICS, using an NI signal, will automatically run back to ≈ 60% reactor power. Further action to manually lower reactor power is not required.

C. ICS, using an NI signal, will automatically run back to ≈ 60% reactor power. The operator must then take manual action to lower and maintain reactor power less than 45%.

D.✔ ICS will automatically run back to ≈ 54% ULD demand. The operator must then take manual action to lower and maintain reactor power less than 45%.

Reasons:

A. With only three RCPs in operation the operator must reduce and maintain reactor power less than 45% when there is a dropped rod.

B. ICS runback is based on ULD demand and with only three RCPs in operation the operator must reduce and maintain reactor power less than 45%.

C. ICS runback is based on ULD demand.

D. Correct. ICS runback is based on ULD demand. The ULD demand of ≈ 54% is approx. 60% Rx Power. Operator must reduce power to less than 45% due to 3 RCP operation.

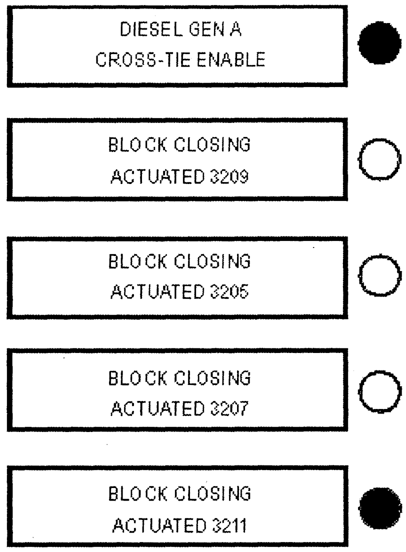
OPS 5-68, Obj. 7; OPS 4-14 Section 1-4.0.F.4; AP-545 Step 3.33

RO - Bank

Reference(s) provided: None

59. BW/A05AK1.3 001/1/2/RO#59/C/A 3.8/3.7/BANK/R/CR03701/4-090-006

The following light indications are present on the main control board. (Dark filled in circles indicate the light is ON.)



Startup	3203	3204
BEST	3205	3206
Unit Aux	3207	3208
EDG	3209	3210
OPT	3211	3212

Which of the following sets of conditions will cause the above indication? Assume sufficient time for automatic actions to have occurred.

A. SP-354A is in progress with Breaker 3209 closed.
The offsite power transformer is OOS (tagged out) for oil leak repair.
A spurious 'A' train ES actuation has just occurred.

B. SP-354A is in progress with Breaker 3209 closed.
The Startup Transformer is OOS (tagged out) for oil leak repair.
A loss of Off-Site power has just occurred, Bkr 3211 has failed to open.

C. SP-354B is in progress with Breaker 3210 closed.
The offsite power transformer is OOS (tagged out) for oil leak repair.
A spurious 'B' train ES actuation has just occurred.

D.✓ SP-354B is in progress with Breaker 3210 closed.
The Startup Transformer is OOS (tagged out) for oil leak repair.
A loss of Off-Site power has just occurred, Bkr 3212 has failed to open.

Reasons:

A. These conditions have 3205, 3206 and 3209 closed. 3210 will be blocked.

B. These conditions have 3209, 3211 and 3212 closed. 3210 will be blocked.

C. These conditions have 3205, 3206 and 3210 closed. 3209 will be blocked.

D. Correct. These conditions have 3209, 3210 and 3212 closed. 3211 will be blocked.

OPS 4-90, Obj. 4; OPS 4-90 Section 1-4.0.O.1 & Figure 11; AR-702 EP 1183

RO - Bank

Reference(s) provided: None

60. BW/A08AK2.1 001/1/2/RO#60/MEM 4.0/3.8/NEW/R/CR03701/

AP-1080 "Refueling Canal/Spent Fuel Pool Level Lowering" contains the following step:

> IF refueling canal level is lowering, THEN notify PPO to close fuel transfer tube valves as far as possible.

Which ONE of the following represents the reason this step directs the valves to be closed "as far as possible" vice closed completely?

A.✔ Fuel transfer carriage cable interference if cables are connected.

B. Manual blocks installed to ensure redundant makeup paths available.

C. Postulated high D/P in the event of a leak in the SFP side.

D. Postulated high D/P in the event of a leak in the RB side.

Reasons:

A. Correct. AP-1080 contains a caution box that reminds the operator that the valves cannot be fully closed when the fuel transfer carriage cables are connected.

B. While certain shutdown conditions require redundant makeup capabilities, no path requires blocking open the fuel transfer tube valves.

C/D. The D/P due to leakage on either side of the valves would be negligible.

OPS 5-72, Obj. 6; AP-1080 Step 3.11

RO - New

Reference(s) provided: None

61. BW/E02EK2.1 001/1/1/RO#61/C/A 3.8/4.0/BANK/R/CR03701/4-012-003

The following plant conditions exist:

PARAMETER	DATA	
Rx power	90%	
Linear amp power range	top 45%	bottom 45%
RCS T_{hot}	601° F	
RCS pressure	1955 psig	
RCS flow	1.47×10^8 lbm/hr	
RB pressure	+0.5 psig	
RCP monitor	A 8,300 kw	
	B 7,100 kw	
	C 9,500 kw	
	D 8,000 kw	
Turbine auto stop oil	99 psig	
MFW control oil	114 psig	

Based on the above data which ONE of the following parameter changes will require immediate entry into EOP-2, Vital System Status Verification? (consider each option independently)

A.	Linear amp power range	top 40	bottom 60
B.	RCP monitor	B 2152 kw	
C.✓	RCS pressure	1925 psig	
D.	MFW control oil	60 psig	

Reasons:

A. For this power level axial imbalance would need to be approximately 30.

B. Setpoint for loss of an RCP is < 1152 kw or >14,400 on two RCPs.

C. Correct. Variable low pressure trip setpoint is 1928 psig.

D. MFW conrol oil trip setpoint is 55 psig.

OPS 4-12, Obj. 4; TS Table 3.3.1-1; COLR

RO - Bank

Reference(s) provided: None

62. BW/E03EA2.1 001/1/2/RO#62/C/A 3.0/4.0/BANK/R/CR03701/5-085-006
Following a reactor trip and completion of EOP-2, Vital System Status Verification, Immediate Actions, the SPDS screens display a "-11" with a yellow background. What does this display mean and what action should follow?

A. Reactor Coolant temperature and pressure have entered the Inadequate Core Cooling Region; EOP-3, Inadequate Subcooling Margin, **is** required to be entered prior to the completion of EOP-2.

B.✔ Subcooling Margin has been lost; EOP-3, Inadequate Subcooling Margin, is required to be entered prior to the completion of EOP-2.

C. Reactor Coolant temperature and pressure have entered the Inadequate Core Cooling Region; EOP-2, Vital System Status Verification, is required to be completed prior to transition to another procedure.

D. Subcooling Margin has been lost; EOP-2, Vital System Status Verification, is required to be completed prior to transition to another procedure.

Reasons:

A. and C. The SPDS background would be red if an ICC region had been entered.

B. Correct. Adequate SCM has been lost, EOP-3 should be entered.

D. Once immediate actions are completed in EOP-02, EOP-02 should be exited for EOP-03.

OPS 5-85, Obj. 1 & 5; EOP-2; EOP-3; OPS-4-21 Section 1-4.0.D.7

RO - Bank

Reference(s) provided: None

63. BW/E04EK3.3 001/1/1/RO#63/MEM 4.2/3.8/BANK/R/CR03701/ROT-5-102-013

EOP-4 requires the RCPs be stopped when incore temps rise 50°F above the value recorded when the EOP was entered.

What is the basis for this requirement in accordance with the EOP-TBD for EOP-4?

A. Adequate SCM will soon be lost.

B.✔ Limit OTSG tube to shell stresses.

C. Protects RCP seals.

D. Maintains RCS less than 70% void fraction.

Reasons:

A. Plausible since heatup is in progress. If cooling cannot be restored, a loss of SCM will eventually result which would require a trip of the RCPs.

B. Correct. With no FW supplies to the OTSGs, they are assumed to be dry. With no inventory to thermally couple the shell with the tubes, the shell will be cooling down at ~ 6 degrees per hr. The tubes will heat up at the same rate as the RCS. This can lead to excessive compressive stresses. Stopping RCPs will slow the rate of temperature rise of the tubes.

C. Plausible since RCP seals can be damaged by thermal stresses. However, cooling to the RCP seals will likely still exist.

D. Plausible since RCPs are tripped on a loss of SCM to ensure they are tripped before the RCS reaches a 70% void fraction.

OPS 5-102, Obj. 3; EOP-TBD cross-step document for EOP-4 Step 3.9

RO - Bank

Reference(s) provided: None

64. BW/E05EK1.2 001/1/1/RO#64/C/A 4.0/4.2/BANK/R/CR03701/5-094-001
The plant is in Mode 3. A reactor trip occurred from 100% power. The plant had been at 100% power for the last 150 days. EOP-2, Vital System Status Verification, immediate actions are complete and verified. The following plant conditions exist:

- Reactor Coolant (RCS) pressure is 2000 psig.
- Pressurizer level is 33 inches.
- "A" OTSG pressure is 890 psig.
- "B" OTSG pressure is 1029 psig.
- RM-A12 reads 5000 cpm.
- ARP-1B is in service.
- Letdown flow is 70 gpm.
- Flow through MUV-31 is 95 gpm.
- Tincore has dropped from 555° F to 545° F in 5 minutes.

Which of the following transitions should be made, if any?
(Reference Included)

A. None, remain in EOP-2.

B. EOP-6, Steam Generator Tube Rupture.

C. EOP-4, Inadequate Heat Transfer

D.✔ EOP-5, Excessive Heat Transfer.

Reasons:

A. Excessive heat transfer is in progress, EOP-5 has the higher priority.

B. While OTSG tube leakage is > 1 gpm, EOP-5 would be applicable since the overcooling event is the higher priority symptom.

C. Plausible because 'B' OTSG pressure is higher than normal, but the actual symptom (based on Tincore change) is excessive heat transfer.

D. Correct. The parameters indicate that excessive heat transfer is in progress.

OPS 5-94, Obj. 1; EOP-5 Section 1.0; AI-505 Sections 3.1.4 & 4.1.2

RO - Bank

Reference(s) provided: RM-A12 Conversion Table (Simulator Version)

65. BW/E09EK3.1 001/1/2/RO#65/MEM 3.2/3.4/BANK/R/CR03701/5-098-002

EOP-09, Natural Circulation Cooldown, contains a table which provides limits on natural circulation cooldown rates.

Which ONE of the following describes the basis for the natural circulation cooldown rate per the EOP-9 TBD?

A.✓ To limit voiding in the reactor vessel head region.

B. To limit thermal stress on the OTSG tubesheet.

C. To maintain a stable or lowering core ΔT.

D. To conserve EFT-2 inventory.

Reasons:

A. Correct. See discussion below.

B. Plausible since tube to shell limits can be of concern. However, these are addressed by the data in Table 3.

C. Plausible since this is an indication natural circulation is in progress but not a reason for the cooldown limit.

D. Plausible since a minimum cooldown rate (2.5° F per 1/2 hour) is specified if secondary makeup is not available. However, this is not the case specified in this question.

The referenced table includes different cooldown rate requirements depending on whether RCS pressure is being maintained above or below the Nat Circ Curve shown on Figure 1 and Figure 2. The difference is based on analysis of reactor head cooldown rate. If pressure is being maintained above the Nat Circ Curve then further void formation is not expected with a cooldown rate of 25 deg F/half hour. If pressure is below the Nat Circ Curve, then cooldown rate must be limited to prevent further head voiding. Head voiding is not expected to cause loss of natural circulation, however, the operators should be aware of and deal with the condition.

OPS 5-98, Obj. 3; EOP-TBD cross-step document for EOP-9; ESBD-01; EOP-9 Table 2

RO - Bank

Reference(s) provided: None

66. G2.1.16 001/GENERIC/1/RO#66/MEM 2.9/2.8/MOD/R/CR03701/4-092-001

Which ONE of the following describes how Plant Line 2 can be accessed?

Plant Line 2 can be accessed from the four digit phone (UTF) system by dialing ______.

A. 11

B. 12

C.✓ 14

D. 71

Reasons:

A. Dialing 11 will make a page call.

B. Dialing 12 will access PL-1.

C. Correct. Dialing 14 will access PL-2.

D. Dialing 71 will access the PAX phones.

OPS 4-92, Obj. 3; OPS 4-92 Sections 1-4.0.I.8; OP-704 Section 4.2

RO - Modified

Reference(s) provided: None

67. G2.1.32 001/GENERIC/1/RO#67/MEM 3.4/3.8/BANK/R/CR03701/4-087-002
A Limit and Precaution in OP-409, Plant Ventilation System, states that only one Chilled Water pump and one Control Complex chiller may run at a time. What is the basis for this statement?

Ensures:

A. proper CH system flow balance.

B.✓ proper SW system flow balance.

C. proper SC system flow balance.

D. a minimum heat load is available for the running chiller to prevent excessive cycling.

Reasons:

A. & C. CH and SC system flow is not balanced.

B. Correct. Step 3.2.1 of OP-409. SW flow is balanced for EDG calculations.

D. The hot gas recirc valve is used to prevent excessive cycling (surging) under low heat load conditions.

OPS 4-87, Obj. 5; OP-409 Step 3.2.1; OPS 4-87 Section 2-4.0.A.3

RO - Bank

Reference(s) provided: None

68. G2.2.13 001/GENERIC/2/RO#68/MEM 3.6/3.8/NEW/R/CR03701/
Which of the following represents a case where it is acceptable to manipulate a piece of equipment with a clearance tag on it per OPS-NGGC-1301, Equipment Clearance?

A. A PPO performing an initial valve lineup checks a valve that is tagged "OPEN".

B. A mechanic uses a valve wrench to manually seat a leaking MOV. Permission from the SPO was obtained.

C. The SPO racks a tagged "OPEN & NOT RACKED IN" RCP breaker into the "Test" position with no Concurrent Verification.

D.✓ Two electricians remove a breaker on ES MCC 3A1 for PM that is tagged "OPEN & NOT RACKED IN"

Reasons:

A. Checking a valve open requires manipulating it slightly in the closed direction. The only person permitted to manipulate a valve to check its position is the clearance Independent Verifier.

B. A valve wrench can never be used on an MOV unless engineering approval has been obtained.

C. This activity would be allowed only if a concurrent verification is performed while placing the breaker in test.

D. Correct. MCC and power panel breakers can be removed and installed as long as concurrent verification is performed while the breaker is installed.

OPI1301N, Obj. 4; OPS-NGGC-1301 Section 9.1.17; AI-500, Section Appendix 7, Step 2.3.1

RO - New

Reference(s) provided: None

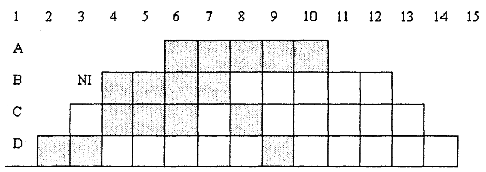
69. G2.2.28 001/GENERIC/2/RO#69/C/A 2.6/3.5/NEW/R/CR03701/

FP-203 "Defueling and Refueling Operations" contains a limit and precaution that states:

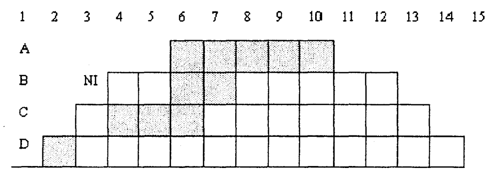
"Core reload/offload refueling patterns shall be arranged such that no more than one fuel assembly is in an uncoupled condition at any time during offload and reload of the fuel assemblies."

Determine which of the following patterns are acceptable [gray area=assembly loaded].

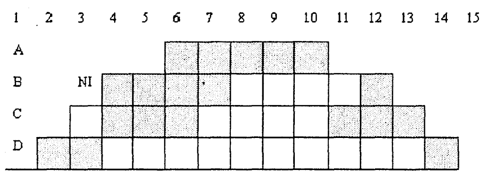
1



2



3



A. Patterns 1, 2, and 3 are NOT acceptable

B. Pattern 1 is acceptable
Patterns 2 and 3 are NOT acceptable

C.✔ Patterns 1 and 2 are acceptable
Pattern 3 is NOT acceptable

D. Pattern 1, 2, and 3 are acceptable

Reasons:

1. Acceptable. C8 and D9 might appear to be uncoupled, but they are in fact coupled diagonally.

2. Acceptable. D2 is uncoupled, but one assembly is permitted to be uncoupled.

3. NOT acceptable. While the bundles in B12, C11, C12, C13, and D14 are coupled with each other, they are not coupled back to the assembly locations closest to the NI (located in quadrant B3 in this drawing).

C. Correct. Patterns 1 and 2 are acceptable per the above discussion. Pattern 3 is unacceptable.

OPS 5-50, Obj. 1 & 2; OPS 5-50 Section 1-10.0; FP-203 Section 3.2.20

RO - New

Reference(s) provided: None

70. G2.2.33 001/GENERIC/2/RO#70/MEM 2.5/2.9/BANK/R/CR03701/4-028-006

The following information is available from the CRD PI panel and the computer for Absolute Position Indication (API) and Relative Position Indication (RPI):

Control Rod	RPI (PI Panel)	API (PI Panel)
7-1	92	93
7-2	93	92
7-3	88	85
7-4	93	93
7-5	94	94
7-6	91	92
7-7	91	92
7-8	92	92

From the above information evaluate the rod position indication with regard to Asymmetric conditions/faults and determine which of the following is the correct indication?

A. PI panel - Asymmetric Fault OFF
Diamond Control panel - Asymmetric Fault OFF

B. PI panel - Asymmetric Fault OFF
Diamond Control panel - Asymmetric Fault ON

C.✔ PI panel - Asymmetric Fault ON
Diamond Control panel - Asymmetric Fault ON

D. PI panel - Asymmetric Fault ON
Diamond Control panel - Asymmetric Fault OFF

Reasons:

A., B., D. Rod 7-3 is 6.625% below the group average (7.57% without the bad rod in the group average. An Asymmetric condition (6.5% = 9") does exist and both the Asymmetric Fault lights should be lit. (PI Panel and Diamond Control Panel)

C. Correct. See above.

OPS 4-28, Obj. 4; OPS 4-28 Section 1-4.0.F.6.c)

RO - Bank

Reference(s) provided: None

71. G2.3.2 001/GENERIC/3/RO#71/C/A 2.5/2.9/MOD/R/CR03701/2-032-001

An area accessible to plant personnel exhibits the following conditions:

- Removable surface contamination of 1,500 dpm/100 cm^2 beta-gamma.
- 200 mr/hour at ***15*** centimeters from a point source hot spot.

Determine the required postings for the conditions above.

A.✔ "Contaminated Area" posting required.
"Radiation Area" posting required.

B. "Contaminated Area" posting **NOT** required.
"Radiation Area" posting required.

C. "Contaminated Area" posting required.
"High Radiation Area" posting required.

D. "Contaminated Area" posting **NOT** required.
"High Radiation Area" posting required.

Reasons:

A. Correct. At 30 centimeters the dose rate should be 50 mr/hr. This meets the 5 to 100 mr/hour definition of a radiation area. An area with removable surface contamination of >1000 dpm/100 cm^2 beta-gamma is considered a contaminated area.

B. Contaminated Area posting is required.

C. A high radiation area is 100 mr/hr to 1000 mr/hr.

D. A high radiation area is 100 mr/hr to 1000 mr/hr. Contaminated Area posting is required.

OPS 2-32, Obj. 12 & 17; OPS 2-32 Section 1-7.0.B; RSP-101 Steps 1.2.1 & 1.2.2

RO - Modified

Reference(s) provided: None

72. G2.3.4 001/GENERIC/3/RO#72/C/A 2.5/3.1/BANK/R/CR03701/5-043-003

Work is to be completed in a radiation area. This work requires a team of two employees. The following information is provided on the employees:

Employee ONE, TEDE = 1.25 Rem
Area that employee ONE will be in has a dose rate of 200mr/hr

Employee TWO, TEDE = 1.0 Rem
Area that employee TWO will be in has a dose rate of 335mr/hr

What is the maximum amount of time this team can work together without exceeding either the Administrative and/or NRC Limits? (Assume all dose received year-to-date has been Progress Energy dose.)

A.✔ 2.9 hours

B. 3.7 hours

C. 11.9 hours

D. 18.7 hours

Reasons:

A. Correct. 2.9 hours is the limit for employee TWO to prevent exceeding the administrative limit of 2 Rem.

B. 3.7 hours is the limit for employee ONE to prevent exceeding the administrative limit of 2 Rem. Since these two are working as a team the controlling factor will be employee TWO.

C. This time is based on employee TWO not exceeding the NRC limit. The administrative limit is the most restrictive and will be the limiting factor.

D. This time is based on employee ONE exceeding the NRC limit. The administrative limit is the most restrictive and will be the limiting factor.

OPS 5-43, Obj. 2; DOS-NGGC-0004 Step 9.3

RO - Bank

Reference(s) provided: None

73. G2.4.10 001/GENERIC/4/RO#73/MEM 3.0/3.1/NEW/R/CR03701/
For which ONE of the following alarms is the Reactor Operator **required** to refer to the appropriate Main Control Board Annunciator Response procedure?

A. G-08-08, "Waste Disposal Panel Trouble"

B. O-05-09, "Hydrogen Panel Alarm"

C. N-01-08, "Cond Demin Panel Trouble"

D.✓ B-07-06, "H2 Sampling Panel A Trouble"

Reasons:

A, B, C: Per AI-500 Appendix 3, these alarms are specifically excluded from the AI-500 requirement to review and perform the applicable AR.

D. Correct. Nothing in the stem would indicate this was an expected alarm. Per AI-500 Appendix 3, the AR must be reviewed for each unexpected alarm.

OPS 5-38, Obj. 31; AI-500 Appendix 3, Sections 5.1 and 5.2

RO - New

Reference(s) provided: None

74. G2.4.18 001/GENERIC/4/RO#74/MEM 2.7/3.6/BANK/R/CR03701/5-097-001

The following conditions exist:

- The plant has undergone a loss of adequate subcooling margin
- The situation deteriorated into an inadequate core cooling event
- Incore temperatures entered region 3.
- OTSG heat transfer and adequate subcooling margin have been recovered.
- Reactor Coolant Pumps (RCPs) are not running.

EOP-7, Inadequate Core Cooling, requires that, under these conditions, a 5° F/½ hr cooldown rate be maintained.

Which one of the following is the basis for limiting the cooldown rate to less than 5° F/½ hr cooldown rate?

A. Aids in maintaining PTS limits on the reactor vessel head.

B. Ensures secondary water sources are not depleted.

C. Limits thermal stresses on the fuel assemblies.

D.✓ Prevents loss of natural circulation.

Reasons:

Choices A, B and C are all parameters that are effected by the lower cooldown rate but are not the basis of the action. The basis of the action is to maintain non-condensible gases that may have been generated while in Region 3 in solution. These non-condensible gases could collect in the upper regions of the hot legs and disrupt natural circulation cooling.

The EOP step specifies that the cooldown rate be limited to 5°F per half hour. Because CR-3 does not have a reactor vesselhead vent, the EOPs limit cooldown rate while in natural circulation following entry into ICC region 3. This limit on cooldown rate prevents the RCS from being depressurized so rapidly that noncondensible gasses expand from the head bubble into the loops faster than they can be removed by the hot leg high point vents, resulting in an interruption in natural circulation.

OPS 5-97 Obj. 3; EOP-TBD Cross-Step Document for EOP-7 Step 3.35.

RO - Bank

Reference(s) provided: None

75. G2.4.25 001/GENERIC/4/RO#75/MEM 2.9/3.4/MOD/R/CR03701/5-069-004

A member of the plant security force calls the control room and reports a fire in the Cable Spreading Room.

Which of the following describes the actions, if any, required by the operating crew at this time?

A.✔ Enter AP-880, Fire Protection, only. Verify only one Halon bank has discharged.

B. Enter AP-880, Fire Protection, only. Verify both Halon banks have discharged.

C. Enter AP-880, Fire Protection, and AP-990, Shutdown from Outside the Control Room. Verify only one Halon bank has discharged.

D. Enter AP-880, Fire Protection, and AP-990, Shutdown from Outside the Control Room. Verify both Halon banks have discharged.

Reasons:

A. Correct. The entry conditions for AP-880, Fire Protection, states "If notified of a fire use this procedure." One Halon bank should automatically discharge.

B. Only one Halon bank should automatically discharge.

C. The entry conditions for AP-990, Shutdown from Outside the Control Room, only apply if control room habitability is affected or a loss of plant control.

D. The entry conditions for AP-990, Shutdown from Outside the Control Room, only apply if control room habitability is affected or a loss of plant control. Only one Halon bank should automatically discharge.

OPS 5-69, Obj. 2; AP-880 Entry Condition; AP-880 Step 3.5; OPS 5-69 Att. 1

RO - Modified

Reference(s) provided: None

#	ID	Answers 0
1	003A2.02 1	A
2	004G2.2.25 1	A
3	005AA2.03 1	A
4	009AG2.4.4 1	B
5	025AG2.1.25 1	A
6	026A2.08 1	A
7	027AA2.11 1	A
8	029G2.1.23 1	B
9	034A4.02 1	C
10	036AA2.02 1	D
11	054AA2.04 1	C
12	055EA2.02 1	D
13	062A2.16 1	D
14	064G2.1.22 1	A
15	067AG2.4.41 1	A
16	069AG2.1.12 1	B
17	071A2.02 1	C
18	BW/E05EG2.1.7 1	C
19	G2.1.34 1	B
20	G2.1.4 1	C
21	G2.2.17 1	D
22	G2.2.26 1	C
23	G2.3.4 1	B
24	G2.4.25 1	C
25	G2.4.40 1	D

1. 003A2.02 001/2/1/SRO#1/C/A 3.7/3.9/NEW/S/CR03701/

The following plant conditions exist:

- The plant is at 100% power.
- Seal injection flow has been lost.
- The following RCP information is noted:

Parameter	RCP-1A	RCP-1B	RCP-1C	RCP-1D
SW Out	165° F	170° F	160° F	165° F
Thrust Brg	170° F	200° F	170° F	260° F

Which of the following actions are required to be taken for the above conditions and the basis for those actions per TS Basis?

A.✔ Reduce plant power to 90% using AP-510; stop the affected RCP(s). Power must be reduced prior to tripping the affected RCP(s) to prevent violating DNB limits.

B. Reduce plant power to 90% using AP-510; stop the affected RCP(s). Power must be reduced prior to tripping the affected RCP(s) to prevent violating LHR limits.

C. Trip the reactor and perform EOP-2; stop the affected RCP(s). The reactor must be tripped prior to tripping the affected RCP(s) to prevent violating DNB limits.

D. Trip the reactor and perform EOP-2; stop the affected RCP(s). The reactor must be tripped prior to tripping the affected RCP(s) to prevent violating LHR limits.

Reasons:

A. Correct. Only RCP-1D meets trip criteria. The correct response is to reduce power to 90% and trip the affected pump. Per ITS 3.4.1, the limit of concern due to lower flow is DNB.

B. Per ITS 3.4.1, the limit of concern due to lower flow is DNB.

C. Only RCP-1D meets trip criteria. The correct response is to reduce power to 90% and trip the affected pump.

D. Only RCP-1D meets trip criteria. The correct response is to reduce power to 90% and trip the affected pump. Per ITS 3.4.1, the limit of concern due to lower flow is DNB.

OPS 4-60, Obj. 9; OP-302 Step 3.2.13 & 3.2.16 & Note prior to 4.10.1; 10 CFR 55.43.b.5 & 2

SRO - New

Reference(s) provided: None

2. 004G2.2.25 001/2/1/SRO#2/MEM 2.5/3.7/NEW/S/CR03701/

The following plant conditions exist:

- The plant is at 100% power.
- Engineering reports that, due to a recently completed modification, HPI Recirc to RB Sump valves MUV-543, MUV-544, MUV-545, and MUV-546 could not be opened if needed.

Which LCOs (if any) should be entered for the given condition?

A.✔ All LCOs are met.

B. Enter LCO 3.5.2 Condition A; do not enter LCO 3.0.3.

C. Enter LCO 3.5.2 Condition A; enter LCO 3.0.3.

D. Do not enter LCO 3.5.2 Condition A; enter LCO 3.0.3.

Reasons:

Per ITS 3.5.2 Basis: *"...removing a train of the recirculation line to the RB sump or the entire bank of valves for maintenance does not render the HPI System inoperable, given the diverse ability to recirculate to the Makeup Tank. HPI satisfies Criterion 3 of the NRC Policy Statement which addresses SSCs that are part of the primary success path, and which function or actuate to mitigate a design basis accident or transient challenging a fission product barrier. Since this recirculation line supports piggyback operation in long-term cooling, and piggyback operation is not a primary success path, LCO 3.5.2 need not be entered when this recirculation path is not available."*

A. Correct. See discussion above.

B. Plausible if student believes that an HPI train is inoperable.

C and D. Plausible if student believes that 100% HPI flow does not exist.

OPS 5-01, Obj. 8; ITS 3.5.2 Basis; 10 CFR 55.43.b.2

SRO - New

Reference(s) provided: None

3. 005AA2.03 001/1/2/SRO#3/C/A 3.5/4.4/MOD/S/CR03701/5-001-019

The following plant conditions exist:

- The plant is at 100% power.
- SP-333, Control Rod Exercises, is in progress.
- A malfunction occurs during the evolution and control rods 5-3 and 5-4 drop to 70% withdrawn and remain there. (assume control rods are still trippable).
- No automatic actions occur.

Which of the following action(s) is required and per ITS Bases what is a potential concern with continued operation in this condition?

A.✓ Enter TS 3.1.4 "Control Rod Group Alignment Limits." Continued operation in this condition may result in excessive local LHR.

B. Enter TS 3.1.5 "Safety Rod Insertion Limits." Continued operation in this condition may result in excessive local LHR.

C. Enter TS 3.1.4 "Control Rod Group Alignment Limits." Continued operation in this condition may result in inadequate margin to DNB.

D. Enter TS 3.1.5 "Safety Rod Insertion Limits." Continued operation in this condition may result in inadequate margin to DNB.

Reasons:

A. Correct. TS 3.1.4 should be entered and, per ITS 3.1.4 Basis Applicable Safety Analyses section, increased peaking during the return to power may result in excessive local LHR.

B. While excessive LHR is a potential concern, group 5 is not a safety group. LCO 3.1.5 does not apply.

C. While TS 3.1.4 should be entered, margin to DNB is not a concern described in LCO 3.1.4 Basis.

D. TS 3.1.5 is only required if a Safety Rod is not fully withdrawn. Also, margin to DNB is not a concern described in LCO 3.1.4 Basis.

OPS 5-01, Obj. 12; ITS 3.1.4 and Basis; 10 CFR 55.43.b.2

SRO - Modified

Reference(s) provided: None

4. 009AG2.4.4 001/1/1/SRO#4/C/A 4.0/4.3/NEW/S/CR03701/

The following plant conditions exist:

- The plant is operating at 100% power with Tave stable at 579° F.
- Pressurizer level is 221" and MUT level is 92".
- An unisolable RCS leak occurs.
- After 3 minutes, pressurizer level is 182" and MUT level is 88".

Which of the following procedures are required to be used for this event?

Procedure names are as follows:

AP-520	Loss of RCS Coolant or Pressure
EOP-2	Vital System Status Verification
EOP-3	Inadequate Subcooling Margin
EOP-8A	LOCA Cooldown
EOP-10	Post Trip Stabilization
OP-208	Power Shutdown
OP-209	Plant Cooldown
OP-211	Reactor Shutdown

A. AP-520, OP-208, OP-209, and OP-211

B.✔ AP-520, EOP-2, and EOP-8A

C. EOP-2, EOP-3, and EOP-8A

D. AP-520, EOP-2, and EOP-10

Reasons:

A. Plausible if the leak were small enough to be maintained using normal makeup via MUV-31.

B. Correct. Leak rate would be calculated to be ~ 200 gpm, which would exceed the capacity of normal makeup via MUV-31. AP-520 would be entered and then the reactor would be tripped. AP-520 and EOP-2 would be performed concurrently. With leakage > 100 gpm, EOP-2 will ultimately lead to EOP-8A.

C. Plausible if the leak were large enough to cause a loss of subcooling margin. With a leak size of 200 gpm, normal operator actions would be expected to maintain adequate subcooling margin throughout the event.

D. This path would be chosen if RCS leakage were excessive, but less than 100 gpm.

OPS 5-114, Obj. 1; OPS 5-96, Obj. 6; AP-520 Steps 1.0 & 3.14; EOP-2 Step 3.29; 10 CFR 55.43.b.5

SRO - New

Reference(s) provided: None

5. 025AG2.1.25 001/1/1/SRO#5/C/A 2.8/3.1/MOD/S/CR03701/5-078-003
The following plant conditions exist:

- The Reactor has been shutdown for 10 days.
- "A" Decay Heat Removal train is in service.
- RCS temperature is 90°F.
- RCS level is 136 feet.
- Cold Leg Nozzle Dams are installed.
- The RCS is vented.
- The core has not been unloaded (RV head on).

If a complete loss of decay heat removal occurs, what is the maximum time allowed (per AI-504 "Guidelines for Cold Shutdown and Refueling") to have the reactor building equipment hatch or outage equipment hatch installed? (Reference Included)

A.✓ 64 minutes

B. 71 minutes

C. 2.5 hours

D. 4 hours

Reasons:

A. Correct. Using OP-103H for the given conditions the Time to 200F is calculated to be ~ 64 minutes (2.2732 x 28.35). Per AI-504 Enclosure 5 Step E.1 the equipment hatch or outage equipment hatch must be installed within 2.5 hours of a loss of DHR or the calculated time to 200F, whichever is less.

B. Plausible if the student believes that the the Time to Saturation would be the applicable calculation. Time to Saturation would be calculated as approximately 71 minutes using OP-103H (2.2732 x 31.45).

C. Plausible since AI-504 makes an allowance for 2.5 hours, as long as the Time to 200F is not shorter.

D. Plausible since AI-504 makes an allowance for extending the time to as high as 4 hours for some shutdown conditions. (Step 3.2.2)

OPS 5-78, Obj. 5; OP-103H; AI-504 Step 3.2.2 and Enclosure 5; 10 CFR 55.43.b.5

SRO - Modified

Reference(s) provided: OP-103H (Enclosure 1, Table 5, 9, and 16 only)

6. 026A2.08 001/2/1/SRO#6/C/A 3.2/3.7/NEW/S/CR03701/

The following plant conditions exist:

- A large break LOCA is in progress.
- Building Spray was actuated 6 hours ago.
- RB pressure is 8 psig and stable.
- RB atmosphere I-131 is 10 μCi/cc.
- TSC has approved securing building spray if all other requirements are met.

Which ONE of the following choices represents the correct building spray requirements for these conditions?

A.✔ In accordance with EOP-8A, building spray may be secured.

B. In accordance with EOP-3, building spray may be secured.

C. In accordance with EOP-8A, building spray cannot be secured.

D. In accordance with EOP-3, building spray cannot be secured.

Reasons:

A. Correct. Securing RB Spray requires the following:
- More than 5 hours running
- RB Press < 10 psig and stable or lowering
- I-131 < 13 μCi/cc

All of the above requirements are met. EOP-8A will provide the required guidance.

B. All conditions are met to allow securing building spray. Plausible, since EOP-3 is used to address LOCAs. However, it contains no guidance for securing building spray.

C. While EOP-8A is the correct procedure for the given conditions, all requirements are met to allow securing building spray.

D. Plausible, since EOP-3 is used to address LOCAs. However, it contains no guidance for securing building spray. Also, all requirements are met to allow securing building spray.

OPS 5-95, Obj. 5; OPS 4-62, Obj. 9; EOP-8A Step 3.38; 10 CFR 55.43.b.5

SRO - New

Reference(s) provided: None

7. 027AA2.11 001/1/1/SRO#7/C/A 4.0/4.1/NEW/S/CR03701/

The following plant conditions exist:

- The plant is operating at 70% power.
- RCP-1C was secured and RCS pressure control has been selected to the 'B' Loop.
- The spray valve has failed open and has been manually isolated.
- RCS pressure is currently stable at:
  - A Loop: 2050 psig
  - B Loop: 2075 psig

The departure from nucleate boiling ratio (DNBR) is ___(1)___ now than before the spray valve malfunction and the LCO for DNB is ___(2)___.

A.✔ (1) lower
(2) not met because 'A' Loop pressure is less than the limit

B. (1) lower
(2) met because 'B' Loop pressure is greater than the limit

C. (1) higher
(2) not met because 'A' Loop pressure is less than the limit

D. (1) higher
(2) met because 'B' Loop pressure is greater than the limit

Reasons:

DNBR= heat flux necessary to cause DNB / actual heat flux

A. Correct. With a lower RCS pressure, the margin to DNB has been reduced. This leads to a lower DNBR. Per LCO 3.4.1 and the COLR, the DNB pressure limit is 2064 psig. SR 3.4.1.1 has a note that requires the loop with two RCPs in operation be used to determine if the limit is met. Since B Loop has only 1 RCP in operation, A Loop pressure would be used.

B. This answer would be correct if the A Loop only had 1 RCP in service and the B Loop had 2.

C. Plausible if the candidate misunderstands the definition of DNBR.

D. Plausible if the candidate misunderstands the definition of DNBR.

OPS 5-01, Obj. 12; ITS LCO 3.4.1 and LCO 3.4.1 Basis; COLR; 10 CFR 55.43.b.2

SRO - New

Reference(s) provided: None

8. 029G2.1.23 001/2/2/SRO#8/C/A 3.9/4.0/BANK/S/CR03701/007-003
Which ONE of the following is the required post-LOCA hydrogen purge flow rate for a purge to be started 1,350 hours after a LOCA?
(Reference Included)

A. If an initial purge is to be started, the required purge flow rate is 17.0 scfm.

B.✓ If an initial purge is to be started, the required purge flow rate is 14.5 scfm.

C. If an initial purge with a flow rate of 20 scfm was secured and a second purge is required, the second purge required flow rate is 17.0 scfm.

D. If an initial purge with a flow rate of 20 scfm was secured and a second purge is required, the second purge required flow rate is 14.5 scfm.

Reasons:

A. This is the error corrected value for the purge. This would represent the "actual" flow rate with the required flow rate in progress.

B. Correct. This is the value of the required purge flowrate.

C. and D. If the purge was previously performed then the purge flow from the first purge should be used (20 scfm).

OPS 5-121, Obj. 2; EM-225A; 10 CFR 55.43.b.5

SRO - Bank

SRO Only Justification: While CR3 objectives require ROs to be aware of the purpose of this procedure, the procedural steps being tested are performed by the Accident Assessment Team, not ROs. As a result, knowledge of the tested procedure steps are required only of an SRO (acting in his Emergency Coordinator role).

Reference(s) provided: EM-225A (Enclosure 7 and Enclosure 10 only)

9. 034A4.02 001/2/2/SRO#9/MEM 3.5/3.9/MOD/S/CR03701/ROT-5-001-074
The plant is in Mode 6 with fuel handling in progress when the refueling supervisor notes that the audible Source Range Monitor in the reactor building is inoperable. Which of the following describes the required action(s) for this condition?

A. Neither control room or reactor building audible indications are required for source range operability. Core alteration may continue.

B. Only the control room audible indications are required for source range operability. Core alteration may continue.

C.✔ Immediately suspend all core alterations and positive reactivity changes. Fuel handling may resume if an equivalent portable detector with audible indication is placed in the reactor building.

D. Immediately suspend all core alterations and positive reactivity changes. Fuel handling cannot resume until the installed audible indication is repaired.

Reasons:

A. TS 3.9.2 basis states that the audible indication is required in both the control room and the containment.

B. TS 3.9.2 basis states that the audible indication is required in both the control room and the containment.

C. Correct. This condition represents non-compliance with TS 3.9.2. Condition A must be entered. The required actions are to immediately suspend all core alterations or positive reactivity changes. TS 3.9.2 basis allows the use of functionally equivalent portable detector to satisfy the LCO.

D. This condition represents non-compliance with TS 3.9.2. Condition A must be entered. The required actions are to immediately suspend all core alterations or positive reactivity changes. TS 3.9.2 basis allows the use of functionally equivalent portable detector to satisfy the LCO.

OPS 5-01, Obj. 15; ITS 3.9.2; ITS 3.9.2 Basis; FP-203 Step 3.2.1.1; 10 CFR 55.43.b.2 & 7

SRO - Modified

Reference(s) provided: None

10. 036AA2.02 001/1/2/SRO#10/MEM 3.4/4.1/MOD/S/CR03701/
Fuel movement activities in both the RB and Spent Fuel Pool are in progress. Determine which ONE of the following conditions meet the criteria for a "Significant Fuel Handling Event" IAW FP-203, Defueling and Refueling Operations?

A. RM-A1 rises to its "Warning" setpoint.

B. The operating Decay Heat Removal train secured to facilitate core mapping operations.

C. Count rate rises to 2 times initial value unexpectedly.

D.✔ Refueling canal water level is discovered to be 155 ft.

Reasons:

Significant fuel handling event – are fuel handling events that have resulted in fission product gas release, loss of required shutdown margin, personnel injury, damage to fuel, control components or fuel handling equipment, violation of Tech Specs associated with fuel movement, or loss of SNM.

A. This would not meet the definition of a "significant" fuel handling event since it did not result in any of the conditions listed above.

B. See above definition.

C. See above definition.

D. Correct. LCO 3.9.6 requires canal level > 156' during fuel handling inside the RB. This would represent a violation of TS associated with fuel handling and meets the definition of a significant fuel handling event.

OPS 4-26, Obj. 6; FP-203, Section 4.4; 10 CFR 55.43.b.6 & 7

History: NRC-LOI0401

SRO - Modified

Reference(s) provided: None

11. 054AA2.04 001/1/1/SRO#11/C/A 4.2/4.3/NEW/S/CR03701/

The following plant conditions exist:

- A normal plant shutdown is in progress.
- 'B' EFIC Channel experienced a power supply failure that de-energized the channel.
- RCS temperature is 532°F.

The only operating Main Feed Pump trips concurrent with a steam leak on the 'B' OTSG. Several minutes into the transient the following parameters are noted:

	'A' OTSG	'B' OTSG
Level	20" and rising	20" and lowering
Pressure	850 psig and stable	550 psig and lowering
EFW Flow from EFP-3	100 gpm	0 gpm
EFW Flow from EFP-2	500 gpm	0 gpm

The RO reports that EFV-55 (EFP-2 to B OTSG), EFV-56 (EFP-2 to A OTSG), and EFV-57 (EFP-3 to B OTSG) are full open.

Once "B" EFIC Channel is declared operable, what equipment operability concerns exist?

A. The Vector Valve Enable Logic should be declared inoperable for the "A" EFIC Channel. Continuous operation in this mode is NOT allowed since single failure criterion is NOT met.

B. The Vector Valve Enable Logic should be declared inoperable for the "A" EFIC Channel. Continuous operation in this mode is allowed since single failure criterion will be met.

C.✓ The Vector Valve (FOGG) Logic should be declared inoperable for the "A" EFIC Channel. Continuous operation in this mode is NOT allowed since single failure criterion is NOT met.

D. The Vector Valve (FOGG) Logic should be declared inoperable for the "A" EFIC Channel. Continuous operation in this mode is allowed since single failure criterion will be met.

Reasons:

A. Since the "B" EFIC channel was de-energized the Vector Valve Enable Logic for the "A" Channel had to function correctly in order for the FOGG logic to work in the "D" Channel to close the affected block valves.

B. Since the "B" EFIC channel was de-energized the Vector Valve Enable Logic for the "A" Channel had to function correctly in order for the FOGG logic to work in the "D" Channel to close the affected block valves. If the logic did not function correctly then per TS 3.3.13 basis single failure criterion would NOT be met and actions to take the plant to Mode 4 would be required.

C. Correct. The Vector Valve (FOGG) Logic associated with the "A" Channel only has failed. EFV-57 should be closed. Per TS basis 3.3.14 single failure criterion is not met and continuous operation is not permitted.

D. Per TS basis 3.3.14 single failure criterion is not met and continuous operation is not permitted.

OPS 4-31, Obj. 7; OPS 4-31 Section 1-4.0.E; ITS 3.3.14 Basis; 10 CFR 55.43.b.2

SRO - New

SRO Only Justification: TS 3.3.11, EFIC System Instrumentation, allows continuous operation with channels inoperable for multiple instruments because single failure criterion is still met. The SRO will have to determine that this particular failure does not meet the requirement for single failure criterion and the plant will be required to go to Mode 4.

Reference(s) provided: None

12. 055EA2.02 001/1/1/SRO#12/C/A 4.4/4.6/NEW/S/CR03701/
Given the following conditions:

- Reactor power was at 100%.
- A station blackout has occurred.
- Reactor Coolant Pressure is 1500 psig.
- Reactor Coolant Temperature is 600°F.

Which ONE of the following choices represents the EOP-13 Rule in effect and the appropriate actions to be taken?

A. Rule 1. Maintain RCS temperature as stable as possible to minimize further RCS shrinkage.

B. Rule 1. Initiate maximum possible cooldown to allow CFT makeup to the RCS.

C. Rule 3. Maintain RCS temperature as stable as possible to minimize further RCS shrinkage.

D.✓ Rule 3. Initiate maximum possible cooldown to allow CFT makeup to the RCS.

Reasons:

A. Plausible since Rule 1 would normally be performed for a loss of SCM. Also plausible since reducing RCS temperature will cause the RCS to 'shrink' which would cause further pressure loss.

B. Plausible since Rule 1 would normally be performed for a loss of SCM.

C. Plausible since reducing RCS temperature will cause the RCS to 'shrink' which would cause further pressure loss.

D. Correct. While in EOP-12 no other rules or EOPs should be performed unless directed by EOP-12. EOP-12 does direct Rule 3, but does not direct Rule 1. With adequate SCM lost, EOP-12 directs a maximum possible cooldown. Per the EOP-12 basis, this is consistent with the SBLOCA guidance with HPI not available to allow for CFT injection.

OPS 5-100, Obj. 4; EOP-12 Step 3.20; EOP-12 Note prior to Step 3.1; EOP-TBD cross-step document for EOP-12 Step 3.20; 10 CFR 55.43.b.5

SRO - New

SRO Only Justification: This question is SRO only based on the need to assess conditions provided in the stem and select the appropriate procedure path in EOP-12 (10 CFR 55.43.b.5)

Reference(s) provided: Steam Tables

13. 062A2.16 001/2/1/SRO#13/C/A 2.5/2.9/NEW/S/CR03701/

The plant is operating at 100% power when Q-04-02 "4KV ES Bus Degraded Volt Trip" alarm is received.

Two of the three 'A' ES Bus degraded voltage (SLUR) relays have actuated. Which one of the following states the status of the 'A' EDG and the status of the 'A' ES Bus per AP-730, Grid Instability if bus voltage does not recover?

A. should start. 'A' ES Bus remains operable.

B. should start. 'A' ES Bus must be declared inoperable.

C. should not start. 'A' ES Bus remains operable.

D.✓ should not start. 'A' ES Bus must be declared inoperable.

Reasons:

A. The SLUR relays require 3 out of 3 to cause a diesel start. Plausible since FLUR relays require 2 out of 3 logic. AP-730 requires any ES Bus with voltage < 4.15KV be declared inoperable. SLUR relay setpoint is 3952V, so voltage must have dropped at least that low.

B. The SLUR relays require 3 out of 3 to cause a diesel start. Plausible since FLUR relays require 2 out of 3 logic.

C. The degraded voltage relays (SLUR) require 3 out of 3 logic to start a diesel. AP-730 requires any ES Bus with voltage < 4.15KV be declared inoperable. SLUR relay setpoint is 3952V, so voltage must have dropped at least that low.

D. Correct. The degraded voltage relays (SLUR) require 3 out of 3 logic to start a diesel. AP-730 requires any ES Bus with voltage < 4.15KV be declared inoperable. SLUR relay setpoint is 3952V, so voltage must have dropped at least that low.

OPS 4-90, Obj. 4; OPS 5-30, Obj. 1; OPS 5-126, Obj. 1; AP-730 Step 1.0; AP-770 Step 1.0; AR-702 EP 1747; 10 CFR 55.43.b.5

SRO - New

Reference(s) provided: None

14. 064G2.1.22 001/2/1/SRO#14/C/A 2.8/3.3/MOD/S/CR03701/4-006-013

The following plant conditions exist:

- 'A' Decay Heat train is in service.
- RCS pressure is 250 psig.
- RCS temperature is 210° F.
- Total stored EDG lube oil inventory is determined to be 220 gallons.

Which of the following choices represents the required LCO actions and the TS basis for the EDG stored lube oil inventory requirements.

A.✔ Perform ITS LCO 3.8.1 required actions for both EDGs inoperable. The minimum required oil inventory is based on ensuring one EDG can operate for 7 days.

B. Perform ITS LCO 3.8.1 required actions for both EDGs inoperable. The minimum required oil inventory is based on ensuring both EDGs can operate for 7 days.

C. Perform ITS LCO 3.8.2 required actions for A EDG inoperable. The minimum required oil inventory is based on ensuring one EDG can operate for 7 days.

D. Perform ITS LCO 3.8.2 required actions for A EDG inoperable. The minimum required oil inventory is based on ensuring both EDGs can operate for 7 days.

Reasons:

A. Correct. With the given conditions, the plant is in Mode 4. Both EDGs are required to be operable and LCO 3.8.1 would be applicable for both EDGs inoperable. Per ITS 3.8.3 basis, the minimum lube oil stored inventory is based on allowing one EDG to operate for 7 days at the upper limit of its 200-hour rating.

B. Per ITS 3.8.3 basis, the minimum lube oil stored inventory is based on allowing one EDG to operate for 7 days at the upper limit of its 200-hour rating.

C. Plausible since in Mode 5 and 6 the given conditions would require actions per LCO 3.8.2 for a EDG only.

D. Plausible since in Mode 5 and 6 the given conditions would require actions per LCO 3.8.2 for a EDG only. Per ITS 3.8.3 basis, the minimum lube oil stored inventory is based on allowing one EDG to operate for 7 days at the upper limit of its 200-hour rating.

OPS 4-06, Obj. 1-10; ITS 3.8.1 & 3.8.3 and basis; 10 CFR 55.43.b.2

SRO - Modified

Reference(s) provided: None

15. 067AG2.4.41 001/1/2/SRO#15/C/A 2.3/4.1/NEW/S/CR03701/

The plant is operating at 100% power when Alarm Window F-03-04 "Cntrl Complex Fire Alert" is received. Five minutes after receipt of the alarm, Security calls and reports the following:

- A smoldering fire exists in the 'A' Battery Room
- The fire is contained to the 'A' Battery Room.

Which ONE of the following Emergency Classifications, if any, must be entered 5 minutes after receipt of the alarm?
(Reference Included)

A.✔ No Emergency Classification should be entered

B. Unusual Event

C. Alert

D. Site Area Emergency

Reasons:

A. Correct. EAL 2.14 requires that the fire has not been extinguished within 15 minutes. EAL 2.15 is not met if damage is clearly contained and localized to one train and safe shutdown capability exists. The fire is contained to the 'A' Battery Room.

B. Plausible since this would be the appropriate classification if the event continued for 15 minutes. At this time, only 5 minutes has passed.

C. Plausible since an Alert classification exists for a fire. EAL 2.15 is not met if damage is clearly contained and localized to one train and safe shutdown capability exists. The fire is contained to the 'A' Battery Room.

D. Plausible since a Site Area Emergency classification exists for Loss of Vital DC Power. EAL 4.6 requires a loss of both buses and requires the loss to be sustained for > 15 minutes.

OPS 5-34, Obj. 5; EM-202 Enclosure 1; EAL Bases Manual for EALs 2.14, 2.15, 4.6; 10 CFR 55.43.b.5

SRO - New

Reference(s) provided: EM-202 Enclosure 1 (Page 8 and 16 only)

16. 069AG2.1.12 001/1/2/SRO#16/C/A 2.9/4.0/NEW/S/CR03701/

The following plant conditions exist:

- The plant is in Mode 6.
- The outage equipment hatch is installed and held in place by four bolts.

Which of the following fuel handling and mode restrictions apply based on these conditions in accordance with Technical Specifications?

A. Moving irradiated fuel in containment is acceptable.
The plant can ascend to Mode 4, but not Mode 3.

B.✓ Moving irradiated fuel in containment is acceptable.
The plant cannot ascend to Mode 4.

C. Irradiated fuel cannot be moved in containment.
The plant can ascend to Mode 4, but not Mode 3.

D. Irradiated fuel cannot be moved in containment.
The plant cannot ascend to Mode 4.

Discussion: SP-341 is required to be performed during Modes 1-4 (and prior to entry into Mode 4 from Mode 5). Step 4.2.1 of that procedure requires that the Equipment Hatch be verified to be closed with all visible bolts engaged. Thus, having the outage equipment hatch (a different component than the equipment hatch) installed with only 4 bolts would not meet this surveillance and prevent entry into Mode 4.
Reasons

A. Plausible if the candidate fails to recognize the difference between containment closure and operability.

B. LCO 3.6.1 requires that containment be operable in Modes 1-4. While the hatch in place with 4 bolts meets closure, it would not meet operability. The plant could not ascend to Mode 3 in this condition. Per LCO 3.9.3 Basis closure requirements are met with 4 bolts installed.

C. Plausible if the candidate fails to recognize the difference between containment closure and operability.

D. LCO 3.6.1 requires that containment be operable in Modes 1-4. While the hatch in place with 4 bolts meets closure, it would not meet operability. The plant could not ascend to Mode 3 in this condition. Per LCO 3.9.3 Basis closure requirements are met with 4 bolts installed. Refueling may continue.

OPS 5-01, Obj. 12, 15; ITS LCO 3.6.1 and Basis; ITS LCO 3.9.3 and Basis; 10 CFR 55.43.b.1, 2, 3

SRO - New

Reference(s) provided: None

17. 071A2.02 001/2/2/SRO#17/C/A 3.3/3.6/BANK/S/CR03701/4-061-001
The primary plant operator stops a WDT-1B ("B" Waste Gas Decay Tank) release when WD-19-FQI (release flow monitor) fails low. Which ONE of the following actions must be taken, if any, to re-initiate the release if the flow recorder cannot be fixed?

A. The release may not be re-initiated until the flow monitor is repaired.

B. Grab samples must be collected and analyzed at least once per four hours.

C.✓ The release flow rate must be estimated at least once per four hours.

D. Two independent samples and an independently verified discharge valve alignment must be performed.

Reasons:

A., B, and D. The release is allowed to continue as long as the flow rate is estimated at least once per 4 hours. No other allowance are made for continuing the release.

C. Correct. The release can continue as long as the flow rate is estimated at least once per 4 hours.

OPS 4-61, Obj. 9; ODCM Table 2-3 Action 26; 10 CFR 55.43.b.1

SRO - Bank

Reference(s) provided: None

18. BW/E05EG2.1.7 001/1/1/SRO#18/C/A 3.7/4.4/BANK/S/CR03701/5-014-009
The following plant conditions exist:
(All Immediate Actions and the symptom scan are complete for EOP-2, Vital System Status Verification)

- A reactor trip has occurred.
- The "A" steam generator level is 87% and rising.
- The "B" steam generator level is 43% and rising.
- All Reactor Coolant Pumps (RCP) are operating.
- Both Emergency Feedwater Pumps (EFW) are operating.
- Reactor coolant temperature has lowered from 535° F to 533° F in 30 seconds.
- Reactor coolant pressure is 1850 psig.

Based on the above conditions which of the following describes the appropriate Emergency Operating Procedure and associated rule for this situation?

A. Remain in EOP-2, Vital System Status Verification; EOP-13 Rule 3, EFW/AFW Control.

B. Remain in EOP-2, Vital System Status Verification; EOP-13 Rule 4, Pressurized Thermal Shock.

C.✓ Transition to EOP-5, Excessive Heat Transfer; EOP-13 Rule 3, EFW/AFW Control.

D. Transition to EOP-5, Excessive Heat Transfer; EOP-13 Rule 4, Pressurized Thermal Shock.

Reasons:

A. & B. Due to RCS temperature the conditions are met for entering EOP-5.

C. Correct. For the given conditions an overcooling event would be in progress and EOP-5 would be in use. With OTSG levels excessive and rising, Rule 3 would be provide the guidance to manually control levels.

D. RCS temperature is not low enough for entry into Rule 4 (< 400° F.)

OPS 5-14, Obj. 11; OPS 3-22 Section 1-3.0; EOP-13 Rules 3 & 4; 10 CFR 55.43.b.5

SRO - Bank

SRO Only Justification: This question requires the SRO to evaluate plant conditions given in the stem and select the appropriate procedure and Rule to branch to (10 CFR 55.43.b.5).

Reference(s) provided: None

19. G2.1.34 001/GENERIC/1/SRO#19/C/A 2.3/2.9/NEW/S/CR03701/
Chemistry has determined that secondary specific activity is 0.1 μCi/gm dose equivalent iodine.

This is ____(1)____ the TS limit for secondary specific activity.
Per TS 3.7.16 basis, the most limiting accident involving a release of secondary specific activity is a ____(2)____.

A. (1) above
(2) complete loss of AC power

B.✓ (1) above
(2) steam line break between the RB and MSIVs

C. (1) below
(2) complete loss of AC power

D. (1) below
(2) steam line break between the RB and MSIVs

Reasons:

A. Per TS 3.7.16 basis: While the complete loss of AC will result in more secondary inventory lost over the event, the leaking OTSG will be isolated sooner than in the steam line break accident. This will result in lower overall activity released during the complete loss of AC.

B. Correct. The TS limit for secondary specific activity is 4.5E-4 μCi/gm. The most limiting accident is the steam line break between the RB and MSIV.

C. The given value is greater than the TS limit of 4.5E-4 μCi/gm. See item A above for explanation on Part (2).

D. The given value is greater than the TS limit of 4.5E-4 μCi/gm.

OPS 5-01 Obj. 12; TS 3.7.16; 10 CFR 55.43.b.2

SRO - New

Reference(s) provided: None

20. G2.1.4 001/GENERIC/1/SRO#20/MEM 2.3/3.4/BANK/S/CR03701/5-001-007
The following plant conditions exist:

- The plant is in Mode 3.
- One of the two available PPOs slips and severely sprains his ankle while performing a walkdown of the Reactor Building.
- The PPO is contaminated and is escorted to the hospital by the only two available Health Physics technicians.
- Shift turnover is scheduled in two hours.

Which ONE of the following describes the appropriate response, relating to shift staffing, for this situation?

A. No action is required. Minimum staffing levels are still met.

B. No action is required. Minimum staffing levels are not met but the oncoming shift will report within two hours.

C.✓ Another HP technician is required to be called in immediately and is required to arrive within two hours.

D. Another PPO is required to be called in immediately and is required to arrive within two hours.

Reasons:

A. A minimum of one HP technician is required when fuel is in the reactor.

B. Efforts must be made immediately to replace the HP technician within two hours.

C. Correct. An individual qualified in Radiation Protection procedures shall be on site when fuel is in the reactor. The position may be vacant for not more than 2 hours, in order to provide for unexpected absence, provided immediate action is taken to fill the required position.

D. Only one PPO is required to meet staffing levels.

OPS 5-01, Obj. 14; TS 5.2.2; AI-500 Section 4.4; 10 CFR 55.43.b.1 & 2

SRO - Bank

Reference(s) provided: None

21. G2.2.17 001/GENERIC/2/SRO#21/MEM 2.3/3.5/NEW/S/CR03701/
BSP-1A is scheduled to be removed from service for a 36 hour maintenance window. Maintenance plans to perform the work on day shift only. Who (at a minimum) is required to approve this?

A. Operations Work Coordinator

B. Superintendent Shift Operations

C. Manager Shift Operations

D.✔ Plant General Manager

Reasons:

A. Plausible because the OWC normally approves planned maintenance.

B. Plausible because for non-scheduled maintenance, the OWC is required to inform the CRS or SSO.

C. Plausible because the MSO is the senior licensed individual on-site and provides single point of accountability licensed operations.

D. Correct. AI-500, Appendix 7 Step 1.10 requires PGM approval if a piece of equipment with an LCO time of 72 hours or less will not be worked around the clock.

OPS 5-38, Obj. 21; AI-500 Appendix 7 Step 1.10; 10 CFR 55.43.b.7

SRO - New

Reference(s) provided: None

22. G2.2.26 001/GENERIC/2/SRO#22/C/A 2.5/3.7/NEW/S/CR03701/

The following plant conditions exist:

- A full core offload to the spent fuel pool has been performed
- No DHR trains are available

Which of the following represents the minimum acceptable equipment for spent fuel cooling per AI-504 "Guidelines for Cold Shutdown and Refueling"?

A. One spent fuel cooling train available. One EDG associated with the protected train available, but not necessarily operable.

B. One spent fuel cooling train available. One EDG associated with the protected train operable.

C.✔ Two spent fuel cooling trains available. One EDG associated with the protected train required to be operable.

D. Two spent fuel cooling trains available. Both EDGs required to be operable.

Reasons:

A. Plausible since for other conditions one spent fuel cooling train is acceptable. Also, AI-504 contains guidance (Step 4.0.A.3) that an available DH train does not require the capability to be aligned to an operable EDG.

B. Plausible since for other conditions one spent fuel cooling train is acceptable. Also plausible since shutdown condition 1 does only require one EDG associated with an available spent fuel cooling train be available.

C. Correct. In shutdown condition 1, two methods of SFP cooling must be available. Two trains of spent fuel cooling will meet this requirement. However, only one of the trains has to be backed by an operable EDG.

D. Plausible since both spent fuel cooling trains would be acceptable. However, both EDGs are not required to be operable.

OPS 5-78, Obj. 14; AI-504 Step 4.0.A.5 and Enclosure 1; 10 CFR 55.43.b.7

SRO - New

Reference(s) provided: None

23. G2.3.4 001/GENERIC/3/SRO#23/MEM 2.5/3.1/NEW/S/CR03701/
The following plant conditions exist:

- A General Emergency has been declared based on the fission product matrix.
- An operator is to be sent into the auxiliary building to perform a discretionary damage assessment.
- The operator has received 1000 mrem TEDE this year, but has received NO dose during this event.

Per EM-104 "Operation of the Operational Support Center" what is the maximum dose the operator can receive for this entry?

A. 4 rem

B.✔ 5 rem

C. 9 rem

D. 10 rem

Reasons:

A. Plausible since the operator would have a total of 5 rem for the year with this activity.

B. Correct. During declared emergencies, emergency workers are allowed to receive up to 5 rem TEDE for the duration of the emergency regardless of normal exposure to date for the year.

C. Plausible since this would be the normal 10 rem emergency limit (described in D below) with the operator's 1 rem YTD dose subtracted.

D. Plausible since 10 rem would be the limit for preventing serious injury, protecting valuable property, or preventing a catastrophic incident. Performing a damage assessment meets none of these criteria.

OPS 5-34, Obj. 2; EM-104 Section 3.3.1; EM-202 Enclosure 7; 10 CFR 55.43.b.4

SRO - New

Reference(s) provided: None

24. G2.4.25 001/GENERIC/4/SRO#24/MEM 2.9/3.4/MOD/S/CR03701/5-040-001
The following plant conditions exist:

- Plant is in Mode 1.

Which ONE of the following areas would require the Fire Protection Engineer to evaluate prior to authorizing fire permits in accordance with FIR-NGGC-0003 "Hot Work Permit"?

A. Makeup Pump Room.

B. Unit 4160 V Switchgear Room.

C.✔ Vital Bus Inverter Room.

D. Nuclear Services Seawater Room.

Reasons:

A, B, & D: Plausible since these are all rooms that are important to safety or plant operation, but they are not listed in FIR-NGGC-0003.

C. Correct. In Mode 1-3, the Fire Protection Engineer must evaluate hot work in any "Risk Significant Plant Area". FIR-NGGC-0003 specifically lists the Vital Bus Inverter Rooms as such an area.

OPS 5-40, Obj. 2; FIR-NGGC-0003 Step 3.14 & Step 4.6.1; 10 CFR 55.43.b.3

SRO - Modified

Reference(s) provided: None

25. G2.4.40 001/GENERIC/4/SRO#25/MEM 2.3/4.0/BANK/S/CR03701/ROT-5-034-027
The emergency coordinator (EC) has declared a general emergency. The emergency operations facility, EOF, is not staffed. Besides classification what other duty can NOT be delegated to another emergency team member by the EC?

A. Direct the shutdown of the plant

B. Direct site evacuation

C. Make notifications to the state

D.✓ Determine protective action recommendations

Reasons:

A, B, and C are things that the EC has the authority to do but can also be delegated.

D. Correct. Per EM-202 this item cannot be delegated.

OPS 5-34, Obj. 2; EM-202 Step 3.2.3; 10 CFR 55.43.b.5

SRO - Bank

Reference(s) provided: None