Q #1

Operators are responding to a main steam line break inside Unit 3 containment.

- Containment pressure peaked at 26 psig and is now 15 psig.
- The 3B SG WR level is 15% and lowering.
- No charging pumps are running
- Step 10 of 3-EOP-E-1, "Loss of Reactor or Secondary Coolant," directs establishment of maximum charging flow.
- Seal Water Return temperatures are at 245°F.
- The Unit Supervisor orders closure of the local seal injection valves, 297 A/B/C, before starting the first charging pump.

Which ONE of the following describes why the local seal injection valves are closed at this time?

CCW flow to the thermal barriers has:

A. been lost.
RCP seals already have elevated temperatures and initiation of cold seal injection flow will cause RCP seal damage.

B. been lost.
RCP seal temperatures are still in the allowed range.
Maximum charging flow to the RCS loops via the normal charging path is required.

C. NOT been interrupted.
Seal injection is NOT needed to maintain seal integrity.
Maximum charging flow to the RCS loops via the normal charging path is required.

D. NOT been interrupted.
Seal injection is NOT needed to maintain seal integrity and initiation of cold seal injection flow will cause RCP damage.

Q #1

ANSWER: A

KA: 000026AK3.03

Knowledge for the reasons for the following responses as they apply to the loss of CCW: Guidance contained in EOP for loss of CCW. 4.0/4.2

10CFR55: 41.b.5, 41.b.10

Reference: 3-EOP-E-1, Step 10 RNO BD
5610-T-L1, Sheet 11
5613-M-3030, Sheet 5

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the references.

B. Incorrect because RCP seal temperatures are already heated up per the basis document. Plausible because CCW flow to the thermal barriers has been lost and because maximum charging flow to the RCS loops is required.

C. Incorrect because CCW flow to the thermal barriers has been lost. Plausible because maximum charging flow to the RCS loops is required.

D. Incorrect because CCW flow to the thermal barriers has been lost. Plausible because initiation of cold seal injection flow will cause RCP damage.

Q #2

Unit 4 was at 100% power with all systems in normal alignment when the following events occurred:

- 4C S/G faulted outside containment.
- The reactor failed to trip automatically or manually.
- All other safeguards systems actuated as required.

Operators are performing Step 14 of 4-EOP-FR-S.1, "Response to Nuclear Power Generation/ATWS," which directs them to "Verify steam supply aligned to both trains of AFW pumps from intact S/G(s)."

Which ONE of the following describes the operator action(s) that will ensure steam is supplied to both trains of AFW while ensuring both trains remain separate?

(Note: AFSS-4-006 and AFSS-4-007 are AFW steam supply cross connect valves.)

Direct the NSO to locally:

A. open AFSS-4-006 only.

B. open AFSS-4-007 only.

C. close AFSS-4-007 and then open AFSS-4-006.

D. open AFSS-4-007 and then close AFSS-4-006.

Q #2

ANSWER: D

KA: 000029G2.1.30

As it relates to the ATWS event: Able to locate and operate components, including local controls. 3.9/4.0

10CFR55: 41.b.4, 41.b.7, 41.b.10

Reference: 4-EOP-FR-S.1, Step 14.d.RNO
5614-M-3075, Sheet 1

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that the goal is to restore steam supply from two intact steam generator trains and to maintain train separation and maintain steam supply during the process. The correct way to achieve this is to locally open AFSS-4-007 and then close AFSS-4-006.

New Question

Response Analysis:

A. Incorrect because the RO will direct the NSO to open AFSS-4-007 and then close AFSS-4-006 IAW EOP-FR-S.1, Step 14.d.RNO. Plausible because the procedure step does not specify the desired position of AFSS-4-006. It merely directs operators to manipulate AFSS-4-006.

B. Incorrect because the RO will direct the NSO to open AFSS-4-007 and then close AFSS-4-006 IAW EOP-FR-S.1, Step 14.d.RNO. Plausible because it is correct (but not complete) to locally open AFSS-4-007.

C. Incorrect because the RO will direct the NSO to open AFSS-4-007 and then close AFSS-4-006 IAW EOP-FR-S.1, Step 14.d.RNO. Plausible because the procedure step does not specify the desired position of AFSS-4-006 or AFSS-4-006. It merely directs operators to manipulate AFSS-4-006 and AFSS-4-006.

D. Correct per the references. The RO will direct the NSO to open AFSS-4-007 and then close AFSS-4-006 IAW EOP-FR-S.1, Step 14.d.RNO.

Q #3

Unit 3 is at 100% power with all systems in normal alignment except for 3A S/G level transmitter, LT-3-474 (red channel) which has failed HIGH.

Operators have tripped associated bistables in accordance with 3-ONOP-049.1, "Deviation or Failure of Safety Related or Reactor Protection Channels."

Subsequently, 3A S/G feedwater flow transmitter, FT-3-477 (blue channel), fails LOW.

Which ONE of the following describes the correct operator response?

A. Perform 3-ONOP-049.1 again and trip all bistables associated with FT-3-477.

B. Perform 3-ONOP-049.1 again and trip all bistables associated with FT-3-477 except for the "FW to SF Mismatch Logic" bistable, BS-3-478B-1.

C. Declare Unit 3 is in TS 3.0.3 and immediately initiate a shutdown to Hot Standby.

D. Trip the reactor and transition to 3-EOP-E-0, "Reactor Trip or Safety Injection"

Q #3

ANSWER: D

KA: 000007EA2.02

Able to determine or interpret following as they apply to reactor trip: Proper actions to be taken if the automatic safety functions have not taken place. 4.3/4.6

10CFR55: 41.b.5, 41.b.7, 41.b.10

Reference: 5610-T-L1, Sheet 2
5610-T-L1, Sheet 19
5610-T-D-17, Sheet 1
3-ONOP-049.1, Pages 33 & 45

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that a red (Channel 1) S/G level transmitter with its bistables tripped includes a low level trip bistable. When the blue channel (Channel 3) feed flow transmitter fails, a steam flow/feed flow mismatch logic is made up that combines with the existing low level signal to generate a reactor trip signal.

New Question

Response Analysis:

A. Incorrect because the reactor should have tripped. Operators should transition to EOP-E-0. Plausible, because this is the normal response to a failure of FT-3-477 if a reactor trip signal had not been generated .

B. Incorrect because the reactor should have tripped. Operators should transition to EOP-E-0. Plausible, because this is the response to a failure of FT-3-477 following a failure of LT-3-474 if a reactor trip signal had not been generated .

C. Incorrect because the reactor should have tripped. Operators should transition to EOP-E-0. Plausible, because the unit would be in TS 3.03 if the reactor had not tripped.

D. Correct per the references. The reactor should have tripped as a result of the Low S/G level with steam flow/feed flow mismatch signal generated by the FT-3-477 failure.

Q #4

Following a pressure transient in the RCS, a pressurizer safety valve lifted and subsequently remained open.

- Operators are performing 3-EOP-ES-1.2, "Post LOCA Cooldown and Depressurization.
- RCS subcooling is less than the minimum required.
- With RCS T-hot less than 350°F, operators start one RHR pump and stop one HHSI pump.

Which ONE of the following describes the basis for starting the RHR pump and stopping the HHSI pump?

A. Secondary heat sink will be improved by RHR flow collapsing reactor head voids after stopping the HHSI pump.

B. RCS subcooling will be maintained by the running RHR pump even after the HHSI pump is stopped.

C. Subsequent steam generator U-tube cooldown will be enhanced by the addition of RHR flow through the steam generators.

D. SI injection flow rate will increase resulting in earlier restoration of pressurizer level and minimum RCS subcooling.

Q #4

ANSWER: B

KA: 000008AK3.05

Knowledge for the reasons for the following responses as they apply to the PRZ vapor space accident : ECCS terminating or throttling criteria. 4.0/4.5

10CFR55: 41.b.5, 41.b.7, 41.b.8, 41.b.10

Reference: 3-EOP-ES-1.2, Step 17 BD

Cog Level: 2 Comprehension

Level 2 because the operator must analyze plant conditions and apply thermodynamic principles to determine the effect starting and stopping various injection flows has on subcooling and the effect that the HHSI pumps have on maintaining pressure higher and thus subcooling greater.

New Question

Response Analysis:

A. Incorrect because the RHR pump is no more effective at collapsing head voids than the previously running HHSI pump and this is not the basis as stated by the reference. Plausible because head voids should be expected for a steam space LOCA and SI pumps do help collapse head voids.

B. Correct per the reference. With T-hot < 350°F, RCS pressure is low enough that an RHR pump can maintain pressure and RCS subcooling will be maintained by the running RHR pump even after the HHSI pump is stopped.

C. Incorrect because the addition of RHR flow will not significantly increase flow though the S/Gs and this is not the reason given by the reference. Plausible because S/G U-tube cooldown would be enhanced by additional cooling flow.

D. Incorrect because the SI flow rate is not expected to increase and this is not the basis as stated in the reference. Plausible because RHR pumps are high flow/low pressure pumps vs the HHSI pumps which are low flow/high pressure pumps.

Q #5

Operators are responding to a large break LOCA on Unit 4.

- When the BOP attempts to reset SI on VPB, a circuit failure occurs and the SI signal CANNOT be reset.
- Operators have transitioned to 4-EOP-ES-1.3, "Transfer to Cold Leg Recirculation".
- "Piggy-back" recirc alignment is anticipated.

Which ONE of the following describes the effect of being unable to reset SI?

A. RWST suction from RWST valves, MOV-4-862A and B, cannot be closed requiring closure of BOTH RHR Pump Inlet valves, 4-752A **AND** B.

B. RWST suction from RWST valves, MOV-4-862A and B, cannot be closed requiring closure of EITHER RHR Pump Inlet valves, 4-752A **OR** B.

C. RHR discharge to cold leg isolation valves, MOV-4-744A and B, can NOT be closed requiring local closure of BOTH RHR heat exchanger manual outlet valves, 4-759A **AND** B.

D. RHR discharge to cold leg isolation valves, MOV-4-744A and B, can NOT be closed requiring local closure of EITHER RHR heat exchanger manual outlet valve, 4-759A **OR** B.

Q #5

ANSWER: C

KA: 000011EA2.02
Able to determine and interpret the following as they apply to a LBLOCA:
Consequences to RHR of not resetting SI. 3.3/3.7
10CFR 55: 41.b.7

Reference: 4-EOP-ES-1.3, Step 19 RNO
5613-M-3050, Sht. 1, 5610-T-L1, Sht. 11, 5613-E-25, Shts 28F & 41

Cognitive Level: 2 Comprehension
Level 2 because the operator must understand integrated plant operations, interlocks and response not obtained actions to recognize the effect of not being able to reset SI. Once recognized that the 744 valves cannot be closed and that the 862 valves can be closed, the operator must determine the correct response to close both RHR HX outlet valves per EOP-ES-1.3, Step 19.

New Question

Response Analysis:

A. Incorrect because once energized (Step 10, EOP-ES-1.3), MOV-862 A&B can be closed by placing their control switches in CLOSE (They are powered up and do not have a continuous OPEN signal from SI like MOV-744A&B.). Plausible, because these valves must be closed as part of the process of going on cold leg recirculation and if they could not be closed, it would be correct to close both 752A&B.

B. Incorrect because once energized (Step 10, EOP-ES-1.3), MOV-862 A&B can be closed by placing their control switches in CLOSE (They are powered up and do not have a continuous OPEN signal from SI like MOV-744A&B.) and it would be correct to close both 752A&B.. Plausible, because these valves must be closed as part of the process of going on cold leg recirculation.

C. Correct per the references. If SI cannot be reset, there is a continuous OPEN signal to MOV-4-744A & B. If the valves cannot be closed, EOP-ES-1.3, Step 19 RNO requires closure of both RHR heat exchanger outlet valves.

D. Incorrect because If the valves cannot be closed, EOP-ES-1.3, Step 19 RNO requires closure of both RHR heat exchanger outlet valves, not just one. Plausible because If SI cannot be reset, there is a continuous OPEN signal to MOV-4-744A & B.

Q #6

Unit 3 is at 100% power when annunciator B 2/5, RCP B OIL RESERVOIR HI/LO LEVEL, alarms.

Which ONE of the following describes the correct operator response?

If the cause is verified to be from a:

A. Low reservoir level, plot 3B RCP motor bearing temperatures every 15 minutes.

B. Low reservoir level, trip the reactor, stop the 3B RCP and isolate CCW flow to the oil coolers within 30 minutes.

C. High reservoir level, plot 3B RCP motor and shaft vibration every 15 minutes.

D. High reservoir level, trip the reactor, stop the 3B RCP and increase CCW flow to the oil coolers within 30 minutes.

Q #6

ANSWER: A

KA: 000015/17AA1.02
Able to operate and/or monitor the following as they apply to the RCP Malfunctions (Loss of RC flow): RCP Oil Reservoir level and alarm indicators. 2.8/2.7

10CFR55: 41.b.7

Reference: 3-ARP-097.CR, Ann. B2/5
3-ONOP-041.1, Steps 8 and 43

Cognitive Level: 1 Recall

New Question

Response Analysis:

A. Correct per 3-ONOP-041.1, Step 43.

B. Incorrect because this is the action to be taken if high reservoir level is discovered, not low reservoir level as stated in the response. Plausible because this would be the correct action if the problem was discovered to be high reservoir level.

C. Incorrect because bearing temperatures should be plotted, not vibration. Plausible because this is the correct frequency of monitoring.

D. Incorrect because this is the incorrect response for high reservoir level. CCW flow should be isolated, not increased Plausible because CCW flow to the oil coolers must be altered within 30 minutes in the event of high reservoir level.

Q #7

Unit 3 is at 100% power with all systems in normal alignment. 3A Charging pump is operating.

3-267, 3A Chrg pump suct, isolation valve, experiences a body-to-bonnet leak resulting in a loss of charging flow.

Which ONE of the following describes the correct operator response and the reason for that response?

A. Verify all charging pumps are stopped and then close valve 3-268, Chrg Pump Suct Hdr X-Conn valve, because no charging pumps can deliver flow to the RCS.

B. Stop the 3A Charging pump and start the 3B Charging pump after closing valve 3-268, Chrg Pump Suct Hdr X-Conn valve, because only 3B Charging pump can deliver flow to the RCS.

C. Stop the 3A Charging pump and start 3C Charging pump after closing valve 3-268, Chrg Pump Suct Hdr X-Conn valve, because only the 3C Charging pump can deliver flow to the RCS.

D. Start either of the 3B or 3C Charging pump after closing valve 3-268, Chrg Pump Suct Hdr X-Conn valve, because either 3B or 3C Charging pump can deliver flow to the RCS.

REFERENCE PROVIDED

Q #7

ANSWER: C

KA: 000022AK3.07

Knowledge for the reasons for the following responses as they apply to the Loss of Reactor Coolant Makeup: Isolating charging. 3.0/3.2

10CFR55: 41.b.5, 41.b.10

Reference: 3-ONOP-047.1, Step 4.1
5613-M-3047, Sheet 2

NOTE: PROVIDE 5613-M-3047, Sheet 2 AS A REFERENCE

Cog Level: 2 Comprehension

Level 2 because the RO must evaluate the location of the leak and determine that the leak location disables both the 3A and 3B Charging pumps. The 3C Charging pump is still viable but valve 3-268 must be closed first.

New Question

Response Analysis:

A. Incorrect because 3C Charging pump is still available once valve 3-268 is closed. Plausible because all charging should be stopped and because even if charging could not be recovered, valve 3-268 should be closed to isolate the leak.

B. Incorrect because the 3B Charging pump is disabled as well as the 3A Charging pump. Plausible because the 3A Charging pump needs to be stopped and valve 3-268 should be closed.

C. Correct because the 3A Charging pump needs to be stopped and only the 3C Charging pump can deliver flow but only after valve 3-268 is closed.

D. Incorrect because the 3B Charging pump is disabled as well as the 3A Charging pump. Plausible because the 3C Charging pump can deliver flow but only after valve 3-268 is closed.

Q #8

Unit 4 is in Mode 4 and on RHR cooling.

- A Loss of Off-Site Power (LOOP) occurs.
- The 4A sequencer fails to start its components.

Which ONE of the following describes the correct operator response (if any) in accordance with 4-ONOP-004, "Loss of OFF-Site Power", regarding restoration of CCW pump and RHR pump operation?

The operator will:

A. NOT have to start any CCW or RHR pumps.

B. start one RHR pump only.

C. start one CCW pump only.

D. have to start one CCW and one RHR pump.

Q #8

ANSWER: D

KA: 000025AA1.04

Able to operate and/or monitor the following as they apply to the Loss of RHR System: Closed cooling water pumps. 2.8/2.6

10CFR55: 41.b.7

Reference: 4-ONOP-004, Steps 7 and 8
5614-T-L1, Sheet 12A & 12B

Cog Level: 2 Comprehension

Level 2 because the operator must evaluate the effect of the loss of the 4A sequencer on the final CCW and RHR pump configuration and then the operator must recall the CCW and RHR pump requirements of ONOP-004.

New Question

Response Analysis:

A. Incorrect because the operator will have to start one CCW pump and start one RHR pump. Plausible because if the sequencer had operated properly, the operator would not have had to start any CCW pumps.

B. Incorrect because the operator will have to start one CCW pump and start one RHR pump. Plausible because if the sequencer had operated properly, the operator would not have had to start any CCW pumps and because the operator will have to start one RHR pump.

C. Incorrect because the operator will have to start one RHR pump. Plausible because the operator will have to start one CCW pump.

D. Correct because the operator will have to start one CCW pump and start one RHR pump to establish 2 CCW pumps and 1 RHR pump running IAW 4-ONOP-004.

Q #9

Unit 4 is initially at 70% power with all systems in automatic except the master pressurizer pressure controller, PC-4-444J, which is in manual due to an instrument failure.

- 4B Steam Generator Feed pump (SGFP) breaker subsequently trips.

Which ONE of the following describes the effect of this event on the RCS and the correct operator response?

RCS temperature will INITIALLY:

A. increase.
The RO will drive the PC-4-444J controller output higher to stabilize pressure.

B. increase.
The RO will drive the PC-4-444J controller output lower to stabilize pressure.

C. decrease.
The RO will drive the PC-4-444J controller output higher to stabilize pressure.

D. decrease.
The RO will drive the PC-4-444J controller output lower to stabilize pressure.

Q #9

ANSWER: A

KA: 000027AK1.02
Knowledge of the operational implications of the following concepts as they apply to the pressurizer pressure control malfunctions: Expansion of liquids as temperature increases. 2.8/3.1

10CFR55: 41.b.5, 41.b.7, 41.b.10, 41.b.14

Reference: 4-ONOP-041.5, Step 1.a RNO
SD-009, Figure 22

Cog Level: 2 Comprehension

Level 2 because the operator must analyze that with turbine load reduced first, Tavg will initially increase and then be higher than Tref, and pressurizer level will increase raising pressure. The system will need more spray output to maintain programmed pressure. This requires an increase in controller output to open sprays.

New Question

Response Analysis:

A. Correct per the references.

B. Incorrect because the RO will drive the PC-4-444J controller output higher (toward 100%) to stabilize pressure. Plausible because the resulting turbine runback will initially cause RCS temperature to increase resulting in expansion of reactor coolant into the pressurizer causing RCS pressure to increase.

C. Incorrect because the resulting turbine runback will initially cause RCS temperature to increase resulting in expansion of reactor coolant into the pressurizer causing RCS pressure to increase. Plausible because the RO will drive the PC-4-444J controller output higher (toward 100%) to stabilize pressure

D. Incorrect because the resulting turbine runback will initially cause RCS temperature to increase resulting in expansion of reactor coolant into the pressurizer causing RCS pressure to increase and the RO will drive the PC-4-444J controller output higher (toward 100%) to stabilize pressure. Plausible the response is consistent if the operator does not realize that a turbine runback causes the RCS temperature to increase.

Q #10

Operators are performing 3-EOP-E-3, "Steam Generator Tube Rupture."

- All RCPs are stopped.

After dumping steam from intact S/Gs to increase subcooling, the RO has been directed to open one pressurizer PORV.

Which ONE of the following describes the effect of opening the PORV on pressurizer level, RCS subcooling and S/G tube break flow rate?

	Pressurizer level	RCS subcooling	S/G break flow
A.	Decreases	Decreases	Increases
B.	Increases	Decreases	Decreases
C.	Increases	Increases	Increases
D.	Decreases	Increases	Decreases

Q #10

ANSWER: B

KA: 000038EK1.02

Knowledge of the operational implications of the following concepts as they apply to the SGTR: Leak rate vs pressure drop. 3.2/3.5

10CFR55: 41.b.5, 41.b.10, 41.b.14

Reference: 3-EOP-E-3, NOTE prior to Step 25, Step 25
3-EOP-E-3, Step 25 BD

Cog Level: 1 recall

New Question

Response Analysis:

A. Incorrect because pressurizer level will increase, not decrease and break flow will decrease, not increase. Plausible because subcooling will decrease.

B. Correct per the references.

C. Incorrect because subcooling will decrease, not increase and break flow will decrease, not increase. Plausible because pressurizer level will increase.

D. Incorrect because pressurizer level will increase, not decrease and subcooling will decrease, not increase. Plausible because break flow will decrease

Q #11

Unit 4 is at 50% power when a large main steam line break outside containment downstream (turbine side) of the 4B MSIV and non-return check valve occurs.

Which ONE of the following describes the response of the Unit 4 MSIVs and the reason for that response?

A. 4B MSIV will automatically close due to high steam flow on the 4B S/G with low 4B S/G pressure.
4A and 4C MSIVs will automatically close due to high differential pressure between each S/G and the main steam header.

B. 4B MSIV will automatically close due to high differential pressure between 4B S/G and the main steam header.
4A and 4C MSIVs will automatically close due to high steam flow on the 4A and 4C S/Gs with low Tavg.

C. All of the Unit 4 MSIVs will automatically close due to high steam flow with low Tavg OR low SG pressure sensed on all S/Gs.

D. All of the Unit 4 MSIVs will automatically close due to high differential pressure between each S/G and the main steam header.

Q #11

ANSWER: C

KA: 000040AK2.01

Knowledge of the interrelations between the steam line rupture and the following: Valves. 2.6/2.5

10CFR55: 41.b.4, 41.b.7, 41.b.8

Reference: 5610-T-L1, Sheet 11
5610-T-L1, Sheet 19
5614-M-3072, Sheet 1

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that the location of the break determines the response of the MSIVs. Because the break is downstream of the MSIV/non-return check valve, it does not matter that it is located on the 4B header. All S/Gs will feed the break and all MSIVs will close.

New Question

Response Analysis:

A. Incorrect because 4A and 4C MSIVs will automatically close due to high steam flow with low Tavg OR low SG pressure sensed on all S/Gs. Plausible because 4B MSIV will automatically close due to high steam flow on the 4B S/G with low 4B S/G pressure.

B. Incorrect because 4B MSIV will automatically close due to high steam flow with low Tavg OR low SG pressure sensed on all S/Gs. Plausible because 4A and 4C MSIVs will automatically close due to high steam flow on the 4A and 4C S/Gs with low Tavg.

C. Correct per the references. All of the Unit 4 MSIVs will automatically close due to high steam flow with low Tavg OR low SG pressure sensed on all S/Gs.

D. Incorrect because high steam line / S/G pressure differential does not close MSIVs. Plausible because all of the MSIVs will automatically close

Q #12

With Unit 3 critical at 10^{-8} amps IR power, 3A main feedwater header sheared immediately outside Unit 3 containment.

Which ONE of the following describes the effect on Unit 3?

A low pressurizer pressure reactor trip signal will:

A. trip the reactor.
SI will NOT actuate.

B. trip the reactor.
SI will actuate.

C. NOT trip the reactor.
SI will NOT actuate.

D. NOT trip the reactor.
SI will actuate.

Q #12

ANSWER: D

KA: 000054AK1.01

Knowledge of the operational implications of the following concepts as they apply to the Loss of Main FW: MFW line break depressurizes the S/G (similar to a steam line break) 4.1/4.3

10CFR55: 41.b.4, 41.b.7, 41.b.8

Reference: 5610-T-L1, Sheet 11
5610-T-L1, Sheet 19
5613-M-3074, Sheet 3

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that a feedwater header break at that location will depressurize the 3A S/G and the depressurization will be sensed on the 3A steam header which will result in the High steamline ΔP logic (1/3 S/Gs) being initiated which is not blocked at low power levels. Additionally the operator must recognize that low pressurizer pressure reactor trip is an "At-Power" trip which is blocked at 10^{-8} amps.

New Question

Response Analysis:

A. Incorrect because a low pressurizer pressure reactor trip signal will not trip the reactor and SI will actuate. Plausible because if the unit was at normal power level, a low pressurizer pressure reactor trip signal would trip the reactor based on these conditions.

B. Incorrect because a low pressurizer pressure reactor trip signal will not trip the reactor. Plausible because SI will actuate and if the unit was at normal power level, a low pressurizer pressure reactor trip signal would trip the reactor based on these conditions.

C. Incorrect because SI will actuate. Plausible because a low pressurizer pressure reactor trip signal will not trip the reactor at this power level.

D. Correct per the references. A low pressurizer pressure reactor trip signal will not trip the reactor and SI will actuate.

Q #13

Operators are performing 4-EOP-ECA-0.0, "Loss of All AC Power" and are in the process of depressurizing all intact S/Gs to 180 psig.

What is the consequence if the SG depressurization is NOT stopped until 70 psig?

A. A reactor vessel head void will become large enough to partially uncover the core.

B. A RED path on the Integrity status tree will occur resulting in a challenge to the reactor vessel pressure boundary.

C. A RED path on the Heat Sink status tree will occur resulting in a loss of subcooling.

D. Nitrogen will enter the S/G U-tubes potentially disrupting natural circulation.

Q #13

ANSWER: D

KA: 000055EK1.02
Knowledge of the operational implications of the following concepts as they apply to the station blackout: Natural Circulation Cooling. 4.1/4.4

10CFR55: 41.b.3, 41.b.4, 41.b.7

Reference: 3-EOP-ECA-0.0 BD, CAUTION before Step 26

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because there is too little nitrogen to be released to cause core uncovery and a head void may occur but will not uncover the core and this is not the reason given by the reference. Plausible because nitrogen is expected to accumulate in the reactor vessel head and the rapid depressurization will cause a head void.

B. Incorrect because a red path on Integrity will not occur if the operators stop the depressurization at 70 psig. Saturation temperature for 70 psig (85 psia) is approximately 316°F. Plausible because the cooldown will be enough to result in an orange path on Integrity.

C. Incorrect because a red path on Heat sink will not occur because operators are not permitted to continue the depressurization if all S/G levels drop below 6% and this depressurization is not expected to impair the ability of the AFW pumps to supply adequate AFW flow. Plausible because if a loss of heat sink event did occur, a loss of subcooling would ultimately result.

D. Correct per the references. Nitrogen will enter the S/G U-tubes disrupting natural circulation.

Q #14

CVCS auto-makeup is occurring on Unit 3 when the following events occur:

- Unit 3 reactor automatically trips.
- Unit 3 MSIVs automatically close.
- Train 1 AFW FCVs white light on the console goes out.
- Auto-makeup stops as a result FCV-3-113B closure.
- Unit 3 annunciators go dark.

Which ONE of the following identifies the procedure operators will implement after the unit is stabilized using 3-EOP-ES-0.1, "Reactor Trip Response"?

A. 3-ONOP-005.4, "4KV Bus 3A, 3B or 3D Ground"

B. 3-ONOP-003.9, "Loss of 120 VAC Vital Instrument Panel 3PO9"

C. 3-ONOP-003.5, "Loss of DC Buses 3D23 and 3D23A (3B)

D. 3-ONOP-003.4, "Loss of DC Bus 3D01 and 3D01A (3A)

Q #14

ANSWER: D

KA: 000058G2.4.4
As it relates to the loss of DC power event: Able to recognize abnormal indications for system operating parameters which are entry level conditions for emergency and abnormal operating procedures. 4.0/4.3

10CFR55: 41.b.7, 41.b.10

Reference: 3-ONOP-003.4, Step 1.1 & 2.1, 2.2 & 3.5

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because operators are directed to enter ONOP-003.4 immediately following EOP-ES-0.1. Plausible because a reactor trip, MSIV closure, loss of AFW white light or loss of annunciators could be related to various grounds.

B. Incorrect because operators are directed to enter ONOP-003.4 immediately following EOP-ES-0.1. Plausible because the first step of ONOP-003.9 procedure checks for a reactor trip and analyzes if one is needed and loss of 3P09 previously required a reactor trip.

C. Incorrect because all of the symptoms listed are indicative of a loss of 3D01, not 3D23. Plausible because the reactor will automatically trip and MSIVs will automatically close upon a loss of 3D23

D. Correct per the references

Q #15

Operators are responding to a line break in the Instrument Air (IA) system.

- IA pressure as seen by PI-3-1444 (VPA) is 91 psig and lowering.
- All available IA compressors are running and crossties are open.

The NSO is sent to investigate and reports the following local IA pressure indications:

PI-3-1516, Turbine Area:	91 psig and lowering
PI-3-1517, Containment Area:	80 psig and lowering
PI-3-1518, Aux Bldg, Intake Area, Control Room:	92 psig and lowering

Which ONE of the following describes the correct operator response?

A. Isolate IA to the Containment. Trip the reactor and perform 3-EOP-E-0, "Reactor Trip or Safety Injection."

B. Isolate IA to the Containment. If IA pressure stabilizes above 65 psig, then maintain reactor power stable until IA system repairs are complete.

C. Do NOT isolate IA to the Containment. Trip the reactor and perform 3-EOP-E-0, "Reactor Trip or Safety Injection".

D. Do NOT isolate IA to the Containment. If IA pressure continues to decrease, then trip the reactor and perform 3-EOP-E-0, "Reactor Trip or Safety Injection".

Q #15

ANSWER: A

KA: 000065G2.1.23

As it relates to the loss of instrument air event: Able to perform specific system and integrated plant procedures during all modes of plant operation. 3.9/4.0

10CFR55: 41.b.4, 41.b.10, 45.2

Reference: 0-ONOP-013: CAUTION before Step 16,
NOTE before Step 16,
Step 17 RNO,
FO Page Unit Trip Criteria

Cog Level: 2 Comprehension

Level 2 because the operator must compare the indicated containment IA pressure to IA system pressure and calculate the difference to determine if the pressure drop exceeds 10 psig and then apply procedure actions as required.

New Question

Response Analysis:

A. Correct per the references.

B. Incorrect because the reactor must be tripped when IA is isolated to containment regardless of subsequent air pressure. Plausible because the reactor normally does not have to be tripped if IA pressure stabilizes above 65 psig.

C. Incorrect because IA must be isolated to containment when its pressure drop exceeds 10 psi. Plausible because the reactor must be tripped under these conditions.

D. Incorrect because IA must be isolated to containment when its pressure drop exceeds 10 psi. Plausible because the reactor must be tripped under these conditions.

Q #16

Unit 3 operators are performing 3-EOP-ECA-1.2, "LOCA Outside Containment".

- After closing the SI to Cold Leg Isol valves, MOV-3-843A & B, RCS pressure is increasing.

Which ONE of the following describes the correct operator response and the reason for the response?

Transition to:

A. 3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation" as the steps in ECA-1.2 have been successful.

B. 3-EOP-E-1, "Loss of Reactor or Secondary Coolant" as the steps in ECA-1.2 have NOT been successful.

C. 3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation" as the steps in ECA-1.2 have NOT been successful.

D. 3-EOP-E-1, "Loss of Reactor or Secondary Coolant" as the steps in ECA-1.2 have been successful.

Q #16

ANSWER: D

KA: W/E04EA2.1
Able to determine and interpret the following as they apply to the LOCA OC: Facility conditions and selection of appropriate procedures during abnormal and emergency operations. 3.4/4.3

10CFR55: 41.b.5, 41.b.10

Reference: 3-EOP-ECA-1.2: Step 3.b

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the correct transition is to go to EOP-E-1 if pressure is increasing. Plausible because RCS pressure increasing is an indication that the steps in EOP-ECA-1.2 have been successful and ECA-1.1 is the correct procedure to transition to in that instance.

B. Incorrect because RCS pressure increasing is an indication that the steps in EOP-ECA-1.2 have been successful. Plausible because the correct transition is to EOP-E-1.

C. Incorrect because the correct transition is to go to EOP-E-1 if pressure is increasing and because RCS pressure increasing is an indication that the steps in EOP-ECA-1.2 have been successful. Plausible because EOP-ECA-1.1 is one of only two procedures to exit to from ECA-1.2 and it is the correct transition if efforts have not been successful as stated in the response.

D. Correct per the references. The correct transition is to EOP-E-1 and RCS pressure increasing is an indication that the steps in EOP-ECA-1.2 have been successful.

Q #17

Upon entry into 4-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation", the RO reports Unit 4 RWST level has decreased to 59,000 gallons.

Which ONE of the following describes the correct operator response?

A. Depressurize all intact S/Gs to atmospheric pressure at a rate NOT to exceed an RCS cooldown rate of 100°F/hour to ensure the Unit 4 Accumulators fully inject.

B. Stop the running Unit 4 HHSI, RHR and CS pumps.
Align and start one Unit 3 HHSI pump to deliver flow from Unit 3 RWST.

C. Stop the running Unit 4 RHR and CS pumps.
Continue to run one Unit 4 HHSI pump for as long as it will deliver flow from the Unit 4 RWST.

D. Establish minimum charging to deliver flow from Unit 4 RWST.
When minimum charging flow has been established, stop the running HHSI RHR and CS pumps.

Q #17

ANSWER: B

KA: W/E11EK2.2
Knowledge of the interrelations between the loss of emergency coolant recirc and the following: facility's heat removal systems incl primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility. 3.9/4.3

10CFR55: 41.b.7, 41.b.10

Reference: 4-EOP-ECA-1.1: Steps 1 RNO, 30, 31, 32

Cog Level: 2 Comprehension

Level 2 because the operator must link the knowledge that RWST level < 60,000 gallons requires stopping the safety pumps. The 60,000 criteria is provided in Step 1 of the procedure and stopping the pumps is in Step 31. Additionally the operator must realize that stopping the safety pumps stops safety injection flow to the core and an alternate method of core cooling (opposite unit HHSI flow) is immediately required.

New Question

Response Analysis:

A. Incorrect because the correct response is to stop all safety pumps pulling from that RWST and align the opposite unit's HHSI pump. Plausible because depressurizing S/Gs is a subsequent procedure step but if done it will be performed at the maximum rate.

B. Correct per the references

C. Incorrect because all safety pumps are stopped, including HHSI pumps. Plausible because the RHR and CS pumps are stopped and continuing to run HHSI pumps would continue to provide core cooling flow.

D. Incorrect because the safety pumps need to be stopped now. Plausible because the charging pumps are probably already running (but at maximum speed) and will be allowed to run until RWST level drops to 20,000 gallons.

Q #18

Unit 3 operators are performing 3-EOP-FR-H.1, "Response to Loss of Secondary Heat Sink."

The BOP is attempting to restore AFW flow when the RO reports the following S/G levels:

- 3A S/G: 35% Wide Range and lowering
- 3B S/G: 25% Narrow Range and lowering
- 3C S/G: 30% Narrow Range and lowering

The BOP is unable to immediately restore secondary heat sink.

The STA reports containment temperature has increased to 190°F.

Which ONE of the following describes the correct operator response?

A. Maintain RCPs running. Continue to perform procedure steps to restore AFW flow.

B. Maintain RCPs running. Continue to perform procedure steps to restore Main Feedwater flow.

C. Stop RCPs. Do NOT initiate bleed and feed at this time. Continue to perform procedure steps to restore secondary heat sink.

D. Stop RCPs. Immediately initiate bleed and feed.

Q #18

ANSWER: D

KA: W/E05EK1.2
Knowledge of the operational implications of the following concepts as they apply to the Loss of secondary heat sink: Normal, abnormal and emergency operating procedures associated with the loss of secondary heat sink. 3.9/4.5

10CFR55: 41.b.4, 41.b.8, 41.b.10

Reference: 3-EOP-FR-H.1: CAUTION prior to Step 2, Step 12

Cog Level: 2 Comprehension

Level 2 because the operator must evaluate the S/G levels provided based on adverse containment conditions (>180°F). The operator must also recognize that 35% WR S/G level is < 32% NR level and bleed and feed criteria are met.

New Question

Response Analysis:

A. Incorrect because RCPs need to be tripped immediately. Plausible because operators will continue efforts to restore AFW flow.

B. Incorrect because RCPs need to be tripped immediately. Plausible because operators will continue efforts to restore main feedwater flow.

C. Incorrect because bleed and feed needs to be established immediately. Plausible because RCPs need to be stopped.

D. Correct per the references. RCPs need to be stopped and bleed and feed needs to be immediately initiated.

Q #19

Unit 3 is in Mode 6 when the RO is notified that a spent fuel element has dropped onto the Region II fuel racks.

Which ONE of the following identifies control room indications that can be used to determine if the fuel element cladding has been breached?

A. CVCS Letdown Process Radiation monitor, R-3-20, alarms

B. Spent Fuel Pit North Wall Area Radiation monitor, RI-3-1421B, alarms

C. Plant Vent Process Radiation monitor, R-14, alarms

D. Plant Vent SPING monitor, RAD-6304, alarms

Q #19

ANSWER: B

KA: 000036AA2.01
Able to determine and interpret the following as they apply to the fuel handling incidents: ARM system indications. 3.2/3.9

10CFR55: 41.b.10, 41.b.11

Reference: 4-ONOP-033.3: Section 2.2

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the letdown monitor alarming is not identified as an indication of a dropped rod and this dropped rod is in the SFP, not the containment. Plausible because there is an indirect path from the SFP to the letdown monitor (through the keyway, transfer canal and RHR system)

B. Correct per the reference. Unit 3 Spent Fuel Pit North Wall Area Radiation monitor, RI-3-1421B, alarms.

C. Incorrect because the event did not occur on Unit 4. Plausible because PRMS-R-14 would alarm if the event had happened on Unit 4.

D. Incorrect because the event did not occur on Unit 4. Plausible because RAD-6304 would alarm if the event had happened on Unit 4.

Q #20

Unit 4 is at 100% power with all systems in normal operation when a tube leak occurs in the 4A S/G.

The tube leak increases to 250 gpm over a period of 5 minutes.

Which ONE of the following describes the effect on charging and letdown flow rates as the leak starts (before operator response) and IMMEDIATELY AFTER operators have performed the prompt actions of 4-EOP-E-0, "Reactor Trip or Safety Injection"?

	Early in S/G Tube Leak Event		After Prompt Actions Complete	
	Chging Flow	Ltdwn Flow	Chging Flow	Ltdwn Flow
A.	Increasing	Unchanged	Zero	Unchanged
B.	Increasing	Decreasing	Maximum	Zero
C.	Increasing	Unchanged	Zero	Zero
D.	Increasing	Unchanged	Maximum	Unchanged

Q #20

ANSWER: C
KA: 000037AK3.03
Knowledge for the reasons for the following responses as they apply to the SGTL: comparison of makeup flow and letdown flow for various modes of operation.
3.1/3.3
10CFR55: 41.b.7

Reference: 4-ONOP-071.2, FO Page Item 1.b, 5610-T-L1, Sheet 32A
SD-009, Page 37, SD-013, Page 18

Cog Level: 2 Comprehension

Level 2 because the operator must evaluate the size of the SGTL. Before SI actuation, Charging pump speed will increase in response to lowering pressurizer level and letdown flow rate will be constant. SI actuation will result in Phase A actuation which will isolate letdown. Charging pumps will be tripped directly by the SI actuation.

New Question

Response Analysis:

A. Incorrect because letdown will isolate following SI actuation as a result of Phase A isolation. Plausible because letdown flow and charging flow will be unchanged initially and charging flow will go to zero after SI actuation.

B. Incorrect because letdown flow will initially be unaffected and charging flow will go to zero after SI actuation. Plausible because charging flow will be unchanged initially and charging pump speed will increase before operators respond and letdown flow will isolate following Phase A actuation.

C. Correct because charging pump speed will increase before operators respond and charging pumps will trip when SI actuates. Letdown flow will initially be unaffected and letdown flow will isolate following Phase A actuation.

D. Incorrect because charging flow will go to zero after SI actuation and letdown will isolate following SI actuation as a result of Phase A isolation. Plausible because Letdown flow will initially be unaffected and because charging pump speed will increase before operators respond.

Q #21

Operators are performing 3-ONOP-100, "Fast Load Reduction" in response to rapidly dropping condenser vacuum.

- Unable to recover vacuum, operators trip the unit and enter the EOPs.
- C 8/3, STEAM DUMP ARMED / ACTUATED, alarmed.
- Tavg initially dropped to 543°F.
- Two minutes after the unit trip Tavg stabilizes at 545°F.
- Annunciator C 8/3 has cleared.

Which ONE of the following describes the reason why annunciator C 8/3 is clear AND the status of the Steam Dump to Condenser (SDTC) System?

The SDTC arming signal is clear because:

A. vacuum dropped below 20".
The SDTC System is disabled.

B. vacuum dropped below 20".
The SDTC System remains fully functional.

C. Tavg dropped to 543°F.
The SDTC System is disabled.

D. Tavg dropped to 543°F
The SDTC System remains fully functional.

Q #21

ANSWER: A

KA: 000051AK3.01
Knowledge for the reasons for the following responses as they apply to the loss of condenser vacuum: loss of steam dump capability upon loss of condenser vacuum. 2.8/3.1

10CFR55: 41.b.4, 41.b.5

Reference: 5610-T-L1, Sheet 22A

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that 20" is a condition that may be expected for this situation and is a signal that disables the SDTC while the 545°F Tavg is a condition that could also be expected for this situation but does not disable the SDTC. Additionally the operator must recognize that the alarm being extinguished under these circumstances implies the system is disabled.

New Question

Response Analysis:

A. Correct per the references The SDTC arming signal is clear because vacuum dropped below 20" and the SDTC System is disabled.

B. Incorrect because the SDTC system has become disabled. Plausible because it became disabled when vacuum dropped below 20".

C. Incorrect because even though Tavg may have dropped below 543°F, it is now above 543°F and the system is not disabled because of previously dropping below 543°F. Plausible because the system is disabled but it is due to the low vacuum.

D. Incorrect because the SDTC system has been disabled. Plausible because Tavg may have dropped below 543°F following the trip.

Q #22

The Shift Manager directs evacuation of the control room per 0-ONOP-105, "Control Room Evacuation."

- At the Alternate Shutdown Panel (ASP), the RO inserts handles into the yellow bordered switches and places them in the LOCAL position.

Which ONE of the following describes the purpose of the transfer switches associated with the AFW flow control valves (FCVs)?

A. transfers control of Train 2 FCVs to the ASP

B. enables local control of Train 2 FCVs at the valves

C. transfers control of Train 1 FCVs to the ASP

D. enables local control of Train 1 FCVs at the valves

Q #22

ANSWER: A

KA: 000068G2.1.28
As it relates to the control room evacuation event: Knowledge of the purpose and function of major system components and controls. 3.2/3.3

10CFR55: 41.b.4, 41.b.7, 41.b.8

Reference: O-ONOP-105, Attachment 3, NOTE prior to Step 6, Step 6
SD-153, Page 41, Figure 4C, 4D

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference. The transfer switches transfer control of Train 2 FCVs to the ASP

B. Incorrect because local hand control of the AFW valves at the valves is independent of the transfer switch. Plausible because these are the same Train 2 FCVs that are controlled from the ASP when the transfer switches are in place.

C. Incorrect because the affected valves are Train 2 not Train 1. Plausible because the transfer switches transfer FCVs to the ASP, but it is Train 2 FCVs, not Train 1 FCVs.

D. Incorrect because the affected valves are Train 2 not Train 1. Plausible because local control of AFW valves at the valves is possible, but it is Train 2 FCVs, not Train 1 FCVs

Q #23

The crew is performing a post LOCA cooldown and depressurization in accordance with 4-EOP-ES-1.2, "Post LOCA Cooldown and Depressurization."

- 4B RCP has been started for forced cooling and RCS pressure control.
- Two Emergency Containment Coolers (ECCs) are running.
- All Normal Containment Coolers (NCCs) are operating.

Containment pressure just increased from 19 psig to 22 psig.

Which ONE of the following describes actions associated with operation of the NCCs AND the bases for those actions?

A. Continue Operation of the NCCs to maintain RCP operation and to assist in containment pressure reduction.

B. Continue operation of the NCCs to maximize containment cooling and atmosphere circulation to prevent stratification and eliminate pockets of hydrogen.

C. Stop all NCCs to allow starting the 3rd Emergency Containment Cooler without violating CCW System load requirements.

D. Stop all NCCs to prevent violating CCW System load requirements.

Q #23

ANSWER: D

KA: W/E14EK3.3
Knowledge for the reasons for the following responses as they apply to the high containment pressure: manipulation of controls required to obtain desired operating results during abnormal and emergency situations. 3.5/3.5

10CFR55: 41.b.7, 41.b.8, 41.b.10

Reference: 4-EOP-F-0, Enclosure 5
4-EOP-FR-Z.1, Step 1
4-EOP-FR-Z.1, Step 1 BD

Cog Level: 2 Comprehensive

Level 2 because the operator must recognize that that the conditions have changed requiring transition to EOP-FR-Z.1 which will direct securing of the RCPs which in turn allows the NCCs to be secured.

New Question

Response Analysis:

A. Incorrect because the NCCs and RCPs have to be stopped per EOP-FR-Z.1. Plausible because running NCCs would help to maximize containment pressure reduction and cool the RCP if it was left running.

B. Incorrect because the NCCs have to be stopped per EOP-FR-Z.1. Plausible because running NCCs would help to maximize containment air circulation.

C. Incorrect because procedural limitations restrict operators from running three ECCs. Plausible because an additional ECC would help with the containment pressure reduction.

D. Correct, the NCCs are required to be stopped IAW FR-Z.1 guidance.

Q #24

3-EOP-FR-C.2, "Response to Degraded Core Cooling," directs operators to depressurize the RCS to inject the accumulators into the RCS.

Which ONE of the following describes how the RCS will be depressurized to inject the accumulators and how operators will prevent accumulator nitrogen injection?

A. Open one pressurizer PORV until RCS pressure is less than 80 psig. Isolate accumulators when RCS CET subcooling is less than 30°F.

B. Open one pressurizer PORV until RCS pressure is less than 180 psig. Isolate accumulators when RCS hot leg temperatures are less than 340°F.

C. Dump steam from intact S/Gs until SG Pressure is less than 180 psig. Isolate accumulators when RCS CET subcooling is less than 30°F.

D. Dump steam from intact S/Gs until S/G pressure is less than 80 psig. Isolate accumulators when RCS hot leg temperatures are less than 340°F.

Q #24

ANSWER: D

KA: W/E06EK1.1
Knowledge of the operational implications of the following concepts as they apply to the degraded core cooling: components, capacity and function of emergency systems. 3.6/4.0

10CFR55: 41.b.3, 41.b.4, 41.b.5, 41.b.7

Reference: 3-EOP-FR-C.2, Steps 13 and 15
SD-021, Page 18

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because RCS pressure is reduced by dumping steam from intact S/Gs and Thot < 340°F is the criteria for isolating accumulators. Plausible because opening a PORV is a method often used during EOP implementation to depressurize the RCS.

B. Incorrect because RCS pressure is reduced by dumping steam from intact S/Gs. Plausible because opening pressurizer PORVs is a method often used during EOP implementation to depressurize the RCS and Thot < 340°F is the criteria for stopping the depressurization.

C. Incorrect because the parameter used to judge when to stop dumping steam is S/G pressure. The stopping criteria in ECA-0.0 is S/G Pressure at 180 psig. Plausible because reducing subcooling implies reducing RCS pressure also

D. Correct per the reference. Operators will dump steam from intact S/Gs until S/G pressure is less than 80 psig and isolate accumulators when RCS hot leg temperatures are less than 340°F.

Q #25

In accordance with 3-EOP-ES-1.1, "SI Termination,"

Which ONE of the following describes the basis for restoring seal return flow to the VCT AND why RCS pressure must be greater than 100 psi above VCT pressure before opening MOV-3-381 and MOV-3-6386?

Seal return is restored to the VCT to:

A. stop #1 seal leakoff flow from flowing to the PRT.
RCS pressure must be higher than VCT pressure to prevent Hydrogen intrusion from the VCT into the RCS.

B. stop #1 seal leakoff flow from flowing to the PRT.
RCS pressure must be higher than VCT pressure to prevent reverse flow from the VCT into the RCS.

C. re-establish #1 seal leakoff flow.
RCS pressure must be higher than VCT pressure to prevent Hydrogen intrusion from the VCT into the RCS.

D. re-establish #1 seal leakoff flow.
RCS pressure must be higher than VCT pressure to prevent reverse flow from the VCT into the RCS .

Q #25

ANSWER: B

KA: W/E02EK3.1
Knowledge for the reasons for the following responses as they apply to the SI termination: Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics. 3.3/3.6

10CFR55: 41.b.2, 41.b.3, 41.b.10

Reference: 3-EOP-ES-1.1, Step 20 BD
5613-M-3047, Sheet 3

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the stated reason for the required 100 psi differential in the Basis document is to prevent backflow from VCT to RCS, not to prevent Hydrogen intrusion from the VCT into the RCS. Plausible because stopping seal return flow to the PRT is the reason for restoring normal seal return.

B. Correct per the references. Seal return is restored to the VCT to stop # 1 seal leakoff flow from flowing to the PRT and RCS pressure must be higher than VCT pressure to prevent reverse flow from the VCT into the RCS.

C. Incorrect because stopping seal return flow to the PRT is the reason for restoring normal seal return. Note that even though seal return was isolated, #1 seal leakoff still existed to the PRT. Plausible because Hydrogen is present in the VCT which can find its way to the RCS if a flow path is established.

D. Incorrect because stopping seal return flow to the PRT is the reason for restoring normal seal return. Note that even though seal return was isolated, #1 seal leakoff still existed to the PRT. Plausible because the stated reason for the required 100 psi differential in the Basis document is to prevent backflow from VCT to RCS,

Q #26

A RCS leak has occurred that required a manual reactor trip based on the inability to maintain Pressurizer level.

Operators are performing 4-EOP-ES-1.2, "Post LOCA Cooldown and Depressurization."

The US directs the RO to "depressurize the RCS to refill the pressurizer."

Which ONE of the following identifies the method the RO will use to depressurize the RCS, in order of preference, as directed by 4-EOP-ES-1.2?

A.	1) Normal Spray	2) PRZ PORV	3) Aux Spray
B.	1) Normal Spray	2) Aux Spray	3) PRZ PORV
C.	1) Aux Spray	2) PRZ PORV	3) Steam Dump
D.	1) Aux Spray	2) Normal Spray	3) PRZ PORV

Q #26

ANSWER: A

KA: W/E03EK1.3
Knowledge of the operational implications of the following concepts as they apply to LOCA Cooldown and Depressurization: annunciators and conditions, indicating signals and remedial actions associated with the (LOCA cooldown and depressurization. 3.5/3.8

10CFR55: 41.b.3, 41.b.7, 41.b.10

Reference: 4-EOP-ES-1.2, Step 10

Cog Level: 1 Recall

Bank Question

Response Analysis:

A. Correct per the reference

B. Incorrect because a pressurizer PORV is preferred over Aux Spray.. Plausible because normal spray is the preferred first method to reduce pressure.

C. Incorrect because steam dump is not a method directed by ES-1.2 and a pressurizer PORV is preferred over Aux Spray. Plausible because all three methods listed are effective methods of RCS pressure reduction under these conditions.

D. Incorrect because Normal spray is the first choice directed by ES-1.2. Plausible because all three methods listed are effective methods of RCS pressure reduction under these conditions and all are methods directed by ES-1.2.

Q #27

In accordance with 4-EOP-FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition," which ONE of the following describes the BASIS for starting an RCP?

An RCP is started to:

A. minimize the time to reach Mode 5 by allowing a faster cooldown with forced cooling than with natural circulation and decrease the likelihood of a Pressurized Thermal Shock condition.

B. restore normal pressurizer spray capability to subsequently reduce RCS pressure to the right of the 60°/hr cooldown curve.

C. mix cold SI water with warm RCS water and decrease the likelihood of a Pressurized Thermal Shock condition.

D. mix the water in the vessel and loops to ensure boron concentration is equal throughout the reactor coolant system.

Q #27

ANSWER: C

KA: W/E08G2.1.28

RCS overcooling – PTS, As it relates to the PTS event: Knowledge of the purpose and function of major system components and controls. 3.2/3.3

10CFR55: 41.b.2, 41.b.3, 41.b.7, 41.b.10

Reference: 3-EOP-FR-P.1 BD, Step 27

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because starting an RCP does not allow a faster cooldown rate in FR-P.1. Plausible because the normal cooldown rate limit with RCPs is 100°F/hr and without RCPs is 25°F/hr.

B. Incorrect because RCS pressure will be subsequently maintained within a band between the minimum subcooling curve and the 200°F subcooling curve. Plausible because even though EOP-FR-P.1 does not specify which RCP should be started, operators will normally start an RCP with pressurizer spray capability.

C. Correct per the reference. An RCP is started to mix the cold SI water with warm RCS water and decrease the likelihood of a PTS condition.

D. Incorrect because mixing of boron in the loops is not a basis described in the EOP-FR-P.1 basis document. Plausible because running a RCP provides this desirable benefit.

Q #28

Operators are cooling down the plant in accordance with 3-GOP-305, "Hot Standby to Cold Shutdown."

- 3 A,B, & C RCP pump bearing temperatures have slowly increased
- annunciator H9/6, "RCP A/B/C PUMP/MOTOR HI TEMP" has just alarmed
- 3B RCP lower pump bearing is at 230°F

The present plant conditions are as follows:

- 3B RCP #1 seal ΔP is > 400 psid.
- 3A, B, & C RCP seal injection flow is 10 gpm.
- 3B RCP #1 seal leakoff flow is 0.7 gpm.
- 3B RCP # 1 seal leakoff isol valve, CV-3-303B, is open.
- RCS pressure is 450 psig.

Which ONE of the following describes the correct operator response?

A. Increase seal injection flow to the 3B RCP to greater than 13 gpm.

B. Open the RCP Seal Bypass Valve, CV-3-307.

C. Close the 3B RCP #1 seal leakoff isol valve, CV-3-303B.

D. Increase CCW flow through the 3B RCP thermal barrier.

Q #28

ANSWER: B

KA: 003A4.07
Ability to manually operate and/or monitor in the control room RCP seal bypass.
2.6/2.6

10CFR55: 41.b.5, 41.b.10

Reference: 3-GOP-305, Step 5.3.5.9.d
3-ONOP-041.1, Step 35

Cog Level: 2 Comprehension

Level 2 because the operators must evaluate plant conditions and determine that opening the bypass valve would improve the RCP pump bearing temperature conditions. Many plant conditions must be met in order to use the bypass valve and the operator must analyze the current conditions to determine that it is appropriate and desired in this situation.

New Question

Response Analysis:

A. Incorrect because the required procedural response is to open the RCP Seal Bypass Valve, CV-3-307. Plausible because the RCP seal leakoff flow rate is low and the RCP bearing temperature is increasing.

B. Correct per the reference. With these conditions, operators will open the RCP Seal Bypass Valve, CV-3-307.

C. Incorrect because the required procedural response is to open the RCP Seal Bypass Valve, CV-3-307. Plausible because CV-303B will be closed in a subsequent step in the same procedure (GOP-305, Step 5.19.14,9.b) and would terminate the flow of hot water to the VCT

D. Incorrect because the required procedural response is to open the RCP Seal Bypass Valve, CV-3-307. Plausible because increasing CCW through the thermal barrier would be beneficial to pump bearing cooling if seal injection flow was lost.

Q #29

Unit 3 is at 100% power when VCT level transmitter, LT-3-115, fails high.

Which ONE of the following describes the effect on the plant assuming NO operator action?

VCT level will:

A. decrease.
Auto-makeup will NOT occur.
Auto-swap to the RWST will occur.

B. decrease.
Auto-makeup will NOT occur.
Auto-swap to the RWST will NOT occur.

C. increase.
Auto-makeup will start and stop automatically.
LCV-3-115A will auto-divert to the CVCS HUT.

D. increase.
Auto-makeup will start but NOT stop automatically.
LCV-3-115A will auto-divert to the CVCS HUT.

Q #29

ANSWER: B

KA: 004K1.23
Knowledge of the physical connection and/or cause-effect relationships between the CVCS and the RWST. 3.4/3.7

10CFR55: 41.b.6, 41.b.7

Reference: 3-ONOP-046.4, Step 28, CAUTION and NOTE prior to Step 29

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because auto-swap to the RWST will not occur (2 of 2 low levels required). Plausible because VCT level will decrease and auto-makeup will not occur.

B. Correct per the reference. VCT level will decrease. Auto-makeup will NOT occur. Auto-swap to the RWST will NOT occur.

C. Incorrect because VCT level will decrease and auto-makeup will not occur. Plausible because LCV-115A will auto-divert to the CVCS HUT.

D. Incorrect because VCT level will decrease and auto-makeup will not occur. Plausible because LCV-115A will auto-divert to the CVCS HUT.

Q #30

Unit 3 is operating at 10^{-8} amps Intermediate Range power when an Instrument Air (IA) System leak reduces the IA pressure to 60 psig on both units.

Operator actions are unsuccessful in restoring IA pressure.

Which ONE of the following describes the effect of this event on Unit 3 pressurizer level and the correct operator response?

Pressurizer level will:

A. decrease.
Trip the reactor and perform EOP-E-0, "Reactor Trip or Safety Injection."
Start and stop charging pumps as necessary to restore Pressurizer level to between 22 – 50% using 3-ONOP-013, "Loss of Instrument Air".

B decrease.
Locally close the Letdown orifice isolation valves.
Start additional charging pumps and increase speed in Manual using 3-OP-047, "CVCS Charging and Letdown."

C increase.
Trip the reactor and perform EOP-E-0, "Reactor Trip or Safety Injection."
Start and stop charging pumps as necessary to maintain Pressurizer level between 22 – 50% using 3-ONOP-013, "Loss of Instrument Air".

D. increase.
Place excess Letdown in service using 3-OP-047, "CVCS Charging and Letdown." Place the running charging pump speed controller in Manual and reduce charging pump speed to minimum using 3-OP-047, "CVCS Charging and Letdown."

Q #30

ANSWER: C

KA: 004A2.11
Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: loss of IAS.
3.6/4.2

10CFR55: 41.b.4, 41.b.5, 41.b.10

Reference: 0-ONOP-013, FO Page, Step 13 RNO 2.g.

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that the loss of IA will result in the running charging pump(s) going to full speed and the letdown valves closing resulting in increasing pressurizer level. The operator must also relate the plant conditions and system responses to the need for a reactor must be tripped when IA pressure drops to <65 psig.

New Question

Response Analysis:

A. Incorrect because pressurizer level will increase. Plausible because the correct response to IA pressure at 60 psig is to trip the reactor and enter EOP-E-0 and ONOP-13 directs starting and stopping charging pumps to control Prz level.

B. Incorrect because pressurizer level will increase. Plausible because if level were to decrease, starting additional charging pumps and isolating letdown would be the appropriate operator response.

C. Correct per the reference. Pressurizer level will increase. Operators will trip the reactor and perform EOP-E-0, "Reactor Trip or Safety Injection." They will subsequently start and stop charging pumps as necessary to maintain Pressurizer level between 22 – 50% using 3-ONOP-013, "Loss of Instrument Air".

D. Incorrect because placing excess letdown in service is not possible due to the loss of IA and the charging pumps will run at maximum speed only in Manual. Plausible because pressurizer level will increase.

Q #31

Unit 4 is in Mode 4 with RHR cooling in service.

The automatic controller circuit for RHR Heat Exchanger Bypass Flow control valve, FCV-4-605 has failed resulting in the FCV going closed.

Which ONE of the following describes the correct operator response in accordance with 4-ONOP-050, "Loss of RHR?"

Place FCV-4-605 controller in Manual and raise flow to:

A. between 3000 and 3750 gpm.
If manual control is NOT possible, direct the NSO to locally control FCV-4-605 to raise flow to between 3000 and 3750 gpm.

B. > 3750 gpm.
If manual control is NOT possible, direct the NSO to locally control FCV-4-605 to raise flow to > 3750 gpm.

C. between 3000 and 3750 gpm.
If manual control is NOT possible, open RHR Heat Exchanger Outlet Flow control valve, HCV-4-758 to raise flow to between 3000 and 3750 gpm.

D. > 3750 gpm.
If manual control is NOT possible, open RHR Heat Exchanger Outlet Flow control valve, HCV-4-758 to raise flow to > 3750 gpm.

Q #31

ANSWER: A

KA: 005G2.1.30
As it relates to RHR, ability to locate and operate components, including local controls. 3.9/3.4

10CFR55: 41.b.4, 41.b.7, 41.b.8, 41.b.10

Reference: 4-ONOP-050, Step 7
4-ONOP-041.8, Attachment 1, Step 8.c, 9.d

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference. Operators will place FCV-4-605 controller in Manual and raise flow to between 3000 and 3750 gpm.
If manual control is NOT possible, operators will direct the NSO to locally control FCV-4-605 to raise flow to between 3000 and 3750 gpm.

B. Incorrect because flow should be increased to between 3000 and 3750 gpm. Plausible because if control room control is not possible, the NSO will be directed to locally control FCV-605.

C. Incorrect because operators are directed to use FCV-605, not HCV-758 to locally control flow. Plausible because flow should be increased to between 3000 and 3750 gpm and opening HCV-758 more would increase flowrate and can be done by the RO from the control room.

D. Incorrect because flow should be increased to between 3000 and 3750 gpm and operators are directed to use FCV-605, not HCV-758 to locally control flow. Plausible because opening HCV-758 more would increase flowrate and can be done by the RO from the control room.

Q #32

With Unit 3 at 100% power, the following events occurred:

- The RO manually tripped the reactor due to decreasing pressurizer pressure.
- An automatic SI occurred on the trip depressurization.
- RCS pressure is currently 1700 psig and slowly lowering.
- One minute after the automatic SI signal actuated, the RO depressed both SI reset pushbuttons on VPB.

Which ONE of the following describes the response of the safety injection system?

A. SI immediately resets when the reset pushbuttons are depressed.

B. SI reset occurs one minute after the reset pushbuttons are depressed.

C. SI reset occurs two minutes after the reset pushbuttons are depressed.

D. SI will NOT reset.

Q #32

ANSWER: B

KA: 006A4.08
ECCS - Ability to manually operate and/or monitor in the control room, 4.2/4.3

10CFR55: 41.b.7, 41.b.8
Reference: 5610-T-L1, Sheet 11

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that the SI reset logic is different if the initiating event was SI due to automatic actuation or manual actuation. There is also a difference in reset operation if the automatic initiating signal is still present or has cleared, in this case the initiating signal is still present. The SI signal automatically actuated and is still present, therefore the system "remembers" the reset attempt and SI will reset after an additional minute (2 minutes total). The operator must relate that even though RCS pressure is below the automatic SI setpoint, the system will allow manual reset in two minutes. If the SI signal was manually actuated, the system does not remember the reset attempt within the first 2 minutes and SI will not reset until another reset attempt is made after the 2 minute timer times out.

New Question

Response Analysis:

A. Incorrect because SI did not reset in this situation. Plausible because SI normally resets immediately when operators push the manual reset pushbuttons as it is normally more than two minutes after the initiation signal. SI will reset after one more minute,

B. Correct. There is a two minute delay so SI will reset within one minute.

C. Incorrect because SI was already reset. It reset one minute earlier as the 2 minute timer is from initiation signal and not the reset signal. Plausible because the reset logic does use a 2 minute timer and this would be a correct response if the RO attempted to reset immediately or if the initiating signal had cleared.

D. Incorrect because the auto SI signal is still present and SI reset will occur. Plausible because this would apply if SI was manually initiated or if the initiating auto SI signal had cleared.

Q #33

The NSO reports that the in-service local seal water return filter differential pressure indicator is off-scale high.

Subsequent investigation reveals the in-service seal water return filter has become completely clogged.

Which ONE of the following describes the effect this will have on PRT pressure and the correct actions to respond to the change in PRT pressure?

PRT pressure will:

A. increase
Verify the PRT nitrogen regulator, PCV-3-473, is aligned to the PRT.
Start a waste gas compressor. Open the PRT vent valve, CV-3-549.
When PRT pressure reaches 6 psig to 8 psig, then close CV-3-549.

B. increase
Verify the PRT nitrogen regulator, PCV-3-473, is aligned to the PRT.
Start a waste gas compressor. Open the PRT vent valve, CV-3-549.
When PRT pressure reaches vent header pressure, then close CV-3-549.

C. not be affected
Verify the PRT nitrogen regulator, PCV-3-473, is aligned to the PRT and controlling PRT pressure in the normal range.

D. not be affected
Verify the PRT vent valve, CV-3-549 is open.
When PRT pressure reaches vent header pressure, then close CV-3-549.

Q #33

ANSWER: A

KA: 007A1.02
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRT controls including maintaining PRT pressure. 2.7/2.9

10CFR55: 41.b.3, 41.b.4, 41.b.10

Reference: 3-ARP-097.CR – A7/1,
3-OP-041.3, Section 7.3.2
5613-M-3047, Sheet 3

Cog Level: 2, Comprehension
The operator must realize that clogging the seal water return filter will result in lifting relief valve, RV-382, which relieves to the PRT. This will cause PRT level and pressure to increase. The operator must then recall the correct guidance provided by the ARP and OP.

New Question

Response Analysis:

A. Correct per the reference. PRT pressure will increase. Operators will verify the PRT nitrogen regulator, PCV-3-473, is aligned to the PRT. Start a waste gas compressor. Open the PRT vent valve, CV-3-549. When PRT pressure reaches 6 psig to 8 psig, then close CV-3-549.

B. Incorrect because PRT pressure must reach 6 to 8 psig before closing CV-549. Plausible because PRT pressure will increase and the PRT nitrogen regulator, PCV-3-473, is aligned to the PRT.

C. Incorrect because PRT pressure will increase and the PRT nitrogen regulator, PCV-3-473, is aligned to the PRT. Plausible because when PRT pressure reaches 6 psig to 8 psig, then CV-3-549 is closed.

D. Incorrect because PRT pressure will increase and the PRT nitrogen regulator, PCV-3-473, is aligned to the PRT and because PRT pressure must reach 6 to 8 psig before closing CV-549. Plausible because vent header pressure is lower than 6 to 8 psig and would represent a greater pressure reduction than that provided by the procedure instructions.

Q #34

Unit 3 is at 100% power with all systems in normal alignment when a Loss of All AC Power (LOAAC) occurs.

- The BOP is using Attachment 1 of 3-EOP-ECA-0.0, "Loss of All AC Power," to restore the 3A 4KV Bus which failed to load onto its EDG because of a failure of the 3A sequencer.
- As the BOP verifies 3A 4KV bus stripping, he notes that the 3A Bus loads that were running before the LOAAC still show red light indication.
- The BOP places the 3A CCW pump control switch in the STOP position.

Which ONE of the following describes the response of the 3A CCW pump breaker light indication on VPB after the BOP places its control switch in the STOP position?

The 3A CCW pump green light will:

A. remain on. Its red light will remain off.

B. immediately go off. Its red light will energize and remain on.

C. remain on for 10 seconds at which time it will go off and the red light will go on.

D. remain on for 30 seconds at which time it will go off and the red light will go on.

Q #34

ANSWER: C

KA: 008A4.08
Ability to manually operate and/or monitor in the control room: CCW pump control switch. 3.1/3.8

10CFR55: 41.b.4, 41.b.7

Reference: 5610-T-L1, Sheet 24D

Cog Level: 3 Analysis/Application

Level 3 because the operator must recognize that the 3A sequencer failure includes the bus stripping portion of the sequencer as evidenced by the operator's observation that the 3A Bus loads that were running before the LOAAC still have red breaker light indication. Bus stripping failed to work and bus stripping is the signal that blocks the timed low pressure auto-start of CCW pumps. When the operator takes the 3A CCW pump to off, the breaker opens but 10 seconds later it closes in because bus stripping did not block the low pressure auto-start.

New Question

Response Analysis:

A. Incorrect because its green light will remain on for only 10 seconds at which time it will go out and the red light will come on. Plausible because this is the way the system would respond if the sequencer/bus stripping had not failed.

B. Incorrect because its green light will remain on for only 10 seconds at which time it will go out and the red light will come on. Plausible because more than ten seconds has elapsed and a common misconception is that the breaker will immediately close.

C. Correct per the reference

D. Incorrect because its green light will remain on for only 10 seconds at which time it will go out and the red light will come on. Plausible because this is the way 3C CCW pump indication would respond under these conditions and this is the same train pump.

Q #35

Operators are responding to a small-break LOCA on Unit 3.

Which ONE of the following describes the steps performed by operators to restore the pressurizer heaters while responding to a small-break LOCA in accordance with 3-EOP-ES-1.2, "Post LOCA Cooldown and Depressurization"?

A. To restore BU Group "A ", reset SI.
To restore BU Group "B ", place the Pressurizer Back-up Heater 3B key switch to EMERGENCY.

B. To restore BU Group "A ", reset SI.
To restore BU Group "B ", reset SI, then reset the lock-out relay in the West Electrical Penetration Room.

C. To restore BU Group "B ", place the Pressurizer Back-up Heater 3B key switch to EMERGENCY.
To restore BU Group "A ", reset SI, then reset the lock-out relay in the West Electrical Penetration Room.

D. To restore BU Group "B ", reset SI.
To restore BU Group "A ", reset SI, then reset the lock-out relay in the West Electrical Penetration Room.

Q #35

ANSWER: D

KA: 010A2.01- Ability to (a) predict the impacts of the following malfunctions or operations on the PRZ PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Heater failures. 3.3/3.6

10CFR55: 41.b.3, 41.b.4, 41.b.7

Reference: 3-EOP-ES-1.2, Step 3
5610-T-L1, Sheet 23

Cog Level: 2 Comprehension
Level 2 because the operator must recognize that the response to a SBLOCA implies response to SI actuation. SI actuation is the signal that caused trip of all pressurizer heaters.

New Question

Response Analysis:

A. Incorrect because to restore BU Group "B ", reset SI only, does not require a key-lock switch for SI reset, this is needed for LOOP only. To restore BU Group "A ", reset SI, AND reset the lock-out relay in the West Electrical Penetration Room.

B. Incorrect because to restore BU Group "B ", reset SI only, does not require a lockout relay reset. To restore BU Group "A ", reset SI, AND reset the lock-out relay in the West Electrical Penetration Room.

C. Incorrect because to restore BU Group "B ", reset SI only, does not require a key-lock switch for SI reset, this is needed for LOOP only. To restore BU Group "A ", reset SI, AND reset the lock-out relay in the West Electrical Penetration Room

D. Correct per the references

Q #36

Operators are performing a shutdown of Unit 4 in accordance with 4-GOP-103, "Power Operations to Hot Standby".

- Power is currently 50%.
- First stage pressure transmitter, PT-4-447, fails HIGH.

Which ONE of the following describes the effect of this failure on the normal operation of the reactor protection system during the plant shutdown?

At the current power level, a reactor trip will:

A. result from a turbine trip AND when power is less than 10%, a reactor trip will result from a turbine trip.

B. result from a turbine trip AND when power is less than 10%, a reactor trip will NOT result from a turbine trip.

C. NOT result from a turbine trip AND when power is less than 10%, a reactor trip will result from a turbine trip.

D. NOT result from a turbine trip AND when power is less than 10%, a reactor trip will NOT result from a turbine trip.

Q #36

ANSWER: A

KA: 012K4.06

Knowledge of the RPS design feature(s) and/or interlock(s) which provide for automatic or manual enable/disable of RPS trips. 3.2/3.5

10CFR55: 41.b.7

Reference: 5610-T-L1, Sheet 2, Sheet 17

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that PT-447 failing high has no immediate affect on the RPS system but results in the inability to clear permissive P-7. Normally when turbine power reduces below 10%, the "At-Power" trips which include the turbine tripping the reactor are cleared. The clearing logic requires both PT-447 and PT-446 to be below 10%. With PT-447 failed high it cannot clear and the "At-Power" trips remain instated at all power levels.

New Question

Response Analysis:

A. Correct per the reference. At the current power level, a reactor trip will result from a turbine trip. When power is less than 10%, a reactor trip will also result from a turbine trip.

B. Incorrect because when power is <10%, turbine trip will be able to cause a reactor trip. Plausible because a turbine trip signal can presently cause a reactor trip

C. Incorrect because a turbine trip signal can presently cause a reactor trip. Plausible because when power is <10%, turbine trip will be able to cause a reactor trip.

D. Incorrect because a turbine trip signal can presently cause a reactor trip and because when power is <10%, turbine trip will be able to cause a reactor trip. Plausible because the turbine trip is not normally able to cause a reactor trip below 10% power.

Q #37

Unit 3 reactor power is at 40% with all systems in normal alignment except for NIS power range channel N-41 which is OOS with bistables tripped in accordance with 3-ONOP-059.8, "Power Range Nuclear Instrumentation Malfunction".

Subsequently power range channel N-42 fails low.

Which ONE of the following describes the immediate effect of the N-42 failure on the RCS Loop Low Flow reactor trip logic?

The RCS Loop Low Flow reactor trip logic:

A. has NOT been changed by N-42 failing low and still requires low flow in 2 of 3 loops to trip the reactor.

B. has NOT been changed by N-42 failing low and still requires low flow in 1 of 3 loops to trip the reactor.

C. has been changed by N-42 failing low to require low flow in 2 of 3 loops to trip the reactor.

D. has been changed by N-42 failing low to require low flow in 1 of 3 loops to trip the reactor.

Q #37

ANSWER: A

KA: 012K6.02
Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Redundant Channels. 2.9/3.1

10CFR55: 41.b.7

Reference: 5610-T-L1, Sheet 2, Sheet 17, Sheet 20

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that the throwing of N-41 bistables inserted a "power above P-8" signal to the logic. When N-42 failed low it could not generate a "power above P-8" signal, effectively disabling its input to the logic. However the logic still recognizes inputs from N-43 and N-44 at 40% power and the loop low flow trip logic remains the same even though N-42 input has been disabled.

New Question

Response Analysis:

A. Correct per the reference. the RCS Loop Low Flow reactor trip logic is NOT affected by N-42 failing low and is still 2 of 3 loops low flow to trip the reactor .

B. Incorrect because the RCS Loop Low Flow reactor trip logic was not affected by this N-42 failure. Plausible because the N-42 input to the RCS Loop Low Flow reactor trip logic is disabled.

C. Incorrect because the RCS Loop Low Flow reactor trip logic was not affected by this N-42 failure. Plausible because the trip logic from N-41 was initially changed when the N-41 bistables were originally thrown but that alone was still not enough to change the overall logic from the original 2 of 3 loops low flow to trip.

D. Incorrect because the P-8 loop low flow trips require 3 of 4 power range channels be below 10% to be disabled. Plausible because the reactor trip logic does disable the P-8 loop low trips when < 45% power.

Q #38

Operators are responding to a main steam line break inside containment.

- All safety systems functioned as designed.
- SI has been reset.
- Containment pressure peaked at 21 psig and is now 17 psig.
- H 5/2, "CNTMT ISOLATION ACTIVATED", is in alarm
- As directed by Step 7 of 3-EOP-E-1, "Loss of Reactor or Secondary Coolant", the BOP resets Containment Isolation Signals.

Which ONE of the following correctly describes the status of annunciator H 5/2 after the BOP resets Containment Isolation Signals?

Annunciator H 5/2 is:

A. still in alarm because Phase B relays cannot be reset under these conditions.

B. still in alarm because Containment Ventilation Isolation relays are still tripped.

C. NOT in alarm because the Phase A, and Phase B relays are reset.

D. NOT in alarm because the Containment Ventilation, Phase A, and Phase B relays are reset.

Q #38

ANSWER: B

KA: 013A4.02
Ability to manually operate and/or monitor in the control room reset of ESFAS channels. 4.3/4.4

10CFR55: 41.b.7, 41.b.9

Reference: 4-EOP-E-1, Step 7
4-ARP-097.CR, H 5/2
5610-T-L1, Sht. 11

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that a steamline break inside containment will trigger Phase A & B and Containment Ventilation Isolation. Additionally the operator must recognize that the alarm is active when any of the 3 signals are present (not reset). It takes the reset of all 3 signals to clear the alarm.

New Question

Response Analysis:

A. Incorrect because Phase B relays can be reset under these conditions. Plausible because Annunciator H 5/2 is still in alarm and procedures direct resetting Phase A & B.

B. Correct per the reference. Annunciator H 5/2 is still in alarm because Containment Ventilation Isolation relays are still tripped.

C. Incorrect because Annunciator H 5/2 is still in alarm. Plausible because both Phase A relays and Phase B relays are reset.

D. Incorrect because Annunciator H 5/2 is still in alarm and Containment Ventilation relays are not reset. Plausible because both Phase A relays and Phase B relays are reset.

Q #39

Operators are responding to a simultaneous LOOP/LOCA event.

- 3A EDG FAILED to start.

Which ONE of the following describes the status of the Emergency Containment Coolers (ECCs) after sequencing is complete?

	3A ECC	3B ECC	3C ECC
A.	de-energized	running	running
B.	de-energized	stopped	running
C.	running	stopped	de-energized
D.	running	running	de-energized

Q #39

ANSWER: C

KA: 022K2.01
Knowledge of the power supplies to the containment cooling fans. 3.0/3.1

10CFR55: 41.b.8, 41.b.10

Reference: SD-029, Page 15
5610-T-E-1591, Sheet 1
5613-T-L1, Sheet 12B

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that the sequencers will auto-start their respective ECCs if power to the bus is available. 3A ECC is powered from the "B" train (3B MCC, bkr 30650). 3C ECC is powered from the "A" train 3C MCC, bkr 30729). 3B ECC is powered from either train (swing bus) but does not get an auto start by the sequencer even though the bus will energize.

New Question

Response Analysis:

A. Incorrect because 3C ECC is de-energized and 3B does not auto-start. Plausible because 3A safeguards equipment is normally powered from 3A Train which is de-energized.

B. Incorrect because 3C ECC is de-energized. Plausible because 3A safeguards equipment is normally powered from 3A Train which is de-energized.

C. Correct per the references. 3A ECC is running, 3B ECC is stopped, and 3C ECC is de-energized.

D. Incorrect because 3B ECC does not auto-start. Plausible because 3A ECC is running and 3C ECC is de-energized.

Q #40

Following a large break LOCA, operators have transitioned to 3-EOP-ES-1.3, "Transfer to Cold Leg Recirculation," and are at Step 18 which states, "Determine SI system Piggy-Back Recirculation Requirements."

The RO reports the following plant conditions:

- RWST level is 58,000 gallons
- RHR flow on FI-3-605 is 2800 gpm
- Containment pressure is 12 psig.
- Containment temperature is 178°F.
- All ECF spray valves are closed.

Which ONE of the following is correct regarding subsequent Containment Spray Pump (CSP) operation?

Operators will run:

A. No CSPs.

B. One CSP with suction provided directly from the RWST.

C. One CSP with suction provided from the discharge of the running RHR pump(s).

D. Two CSPs with suction provided from the discharge of the running RHR pump(s).

Q #40

ANSWER: C

KA: 026K4.01
Knowledge of the CSS design feature(s) and/or interlock(s) which provide for: source of water for CSS, including recirculation phase after LOCA 4.2/4.3

10CFR55: 41.b.7, 41.b.8

Reference: 3-EOP-ES-1.3, Steps 18, 21, 23, 25, 26

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that one of the four criteria to discontinue CSP operation is not satisfied. Additionally the operator must recall that one CSP was put in pull-to-lock in Step 2 of EOP-ES-1.3 and must remain in pull-to-lock subsequently. Finally the operator must recognize that subsequent procedure steps change the CSP suction source from the RWST to the discharge of the RHR pumps.

New Question

Response Analysis:

A. Incorrect because 1 CSP must be run under these conditions. Plausible because 3 of the 4 listed parameters support not starting a CSP.

B. Incorrect because when a CSP is subsequently started, cold leg recirculation will have been aligned. Plausible because up to this time the running CSP has been aligned to the RWST.

C. Correct per the reference

D. Incorrect because one CSP was put in pull-to-lock earlier in EOP-ES-1.3 and it will remain in pull-to-lock. Plausible because the running CSP will have its suction provided from the discharge of the running RHR pump(s).

Q #41

Operators are performing 3-EOP-E-1, "Loss of Reactor or Secondary Coolant" and the following plant conditions exist:

- Containment Temperature is 220°F
- Containment Pressure is 19 psig and rising
- All Available Charging Pumps are running
- RWST level is 220,000 gallons

Containment Pressure has just increased to 21 psig. The operators entered 3-EOP-FR-Z.1, "Response to High Containment Pressure" and are assessing Containment Spray pumps (CSPs) status.

Which one of the following describes the correct plant and operator response?

A. Neither CSP auto-started.
Manually start both CSPs.

B. Neither CSP auto-started.
Manually start one CSP and place the other CSP in Pull-To-Lock.

C. Both CSPs auto-started.
Verify both CSPs auto-started.

D. Both CSPs auto-started.
Manually stop one CSP and place it in Standby.

Q #41

ANSWER: A

KA: 026A1.01
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including containment pressure 3.9/4.2

10CFR55: 41.b.7, 41.b.8

Reference: 5610-T-L1, Sheet 11
5613-T-L1, Sheet 12A
30EOP-E-0, Attachment 3, Step 12
3-EOP-FR-Z.1, Step 8

Cog Level: 2 Comprehension

Level 2 because the operator must analyze plant conditions and determine that both CSPs are needed but neither auto-started based on the sequencers having been reset when SI was reset in EOP-E-0 as indicated by charging pumps running.

New Question

Response Analysis:

A. Correct because neither CSP auto started because the sequencer was reset when the operators reset SI in E-0 and both CSPs are needed IAW 3-EOP-FR-Z.1, Step 8 guidance.

B. Incorrect because both CSPs are needed IAW 3-EOP-FR-Z.1, Step 8 guidance. Plausible because neither CSP auto-started because the sequencer was reset when the operators reset SI in E-0.

C. Incorrect because neither CSP auto-started. Plausible because operators are directed to verify both CSPs are running IAW 3-EOP-FR-Z.1, Step 8 guidance.

D. Incorrect because neither CSP auto-started. Plausible because operators are directed to manually stop one CSP and place it in Standby if containment pressure is < 14 psig.

Q #42

Operators have responded to a small break LOCA with a LOOP on Unit 3 and are performing 3-EOP-ES-1.2, Post-LOCA Cooldown and Depressurization."

The RO is preparing to initiate an RCS cooldown to Cold Shutdown by dumping steam from intact steam generators.

Which ONE of the following describes the BASIS for the step that directs the RO to limit steam flow rate to maintain the allowable cool down rate below 100°F/hr?

Excessive steam flow rate may result in:

A. prolonged loss of RCS natural circulation flow.

B. challenging the integrity status tree for pressurized thermal shock limits.

C. automatic closure of the MSIVs which isolates the condenser steam dumps.

D. exceeding the capability of the AFW system to maintain S/G levels above 6% which will require stopping the cooldown.

Q #42

ANSWER: B

KA: 039K5.05
Knowledge of the operational implications of the following concept as it applies to the MRSS: Basis for the RCS cooldown limits 2.7/3.1

10CFR55: 41.b.3, 41.b.4, 41.b.5, 41.b.10

Reference: 3-EOP-ES-1.2 BD, Step 6,

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because excessive steam flow will not terminate RCS NC flow. Plausible because excessive steam flow may temporarily impede NC flow.

B. Correct per the reference. Excessive steam flow rate may result in challenging the integrity status tree for pressurized thermal shock limits.

C. Incorrect because a LOOP is present and operators will be utilizing SDTA system instead of SDTC system and the setpoint to close the MSIVs is 40% of full power steam flow rate which is higher than can be obtained with SDTA or SDTC systems. Plausible because the procedure warns against the possibility of inadvertently closing MSIVs when dumping steam.

D. Incorrect because this procedure does not require operators to stop dumping steam if S/G level drops below 6%. Plausible because another procedure (Ex. ECA-0.0) does require stopping the cooldown rate if SG levels drop below 6%.

Q #43

Unit 4 is at 80% power with all systems in auto. The 4A S/G pressure transmitter, associated with the controlling S/G steam flow transmitter, failed LOW.

Which ONE of the following describes the immediate effect on the:

1) 4A S/G steam flow signal to the feed regulating valve controller AND
2) 4A feed regulating valve AND
3) 4A S/G level?

A. 1) steam flow signal decreases
2) feed regulating valve opens
3) S/G level increases

B. 1) steam flow signal decreases
2) feed regulating valve closes
3) S/G level decreases

C. 1) steam flow signal increases
2) feed regulating valve opens
3) S/G level increases

D. 1) steam flow signal increases
2) feed regulating valve closes
3) S/G level decreases

Q #43

ANSWER: B

KA: 059K1.03
Knowledge of the physical connection and/or cause-effect relationships between the main feedwater and the S/Gs. 3.1/3.3

10CFR55: 41.b.4, 41.b.7

Reference: 5610-T-D-17, Sheet 1
5610-T-D-18B, Sheet 1
SD-11, Page 32

Cog Level: 2 Comprehension

Level 2 because the operator must realize that when the pressure density compensation input to the steam flow signal fails low, the result is the steam flow signal to the feed reg valve controller also goes low. Steam flow is compared to feed flow and the resulting imbalance causes the feed reg valve to go closed with a resulting drop in S/G level.

New Question

Response Analysis:

A. Incorrect because for this failure the steam flow signal decreases, the feed reg valve closes and the S/G level decreases. Plausible because the steam flow signal will decrease.

B. Correct per the references. 4A S/G steam flow signal decreases, feed reg valve closes and S/G level decreases.

C. Incorrect because for this failure the steam flow signal decreases, the feed reg valve closes and the S/G level decreases. Plausible because this response provides an accurate description of the effect of the pressure input failing high

D. Incorrect because for this failure the steam flow signal decreases, the feed reg valve closes and the S/G level decreases. Plausible because the feed reg valve will close and the S/G level will decrease.

Q #44

Unit 4 is operating at 40% power with all systems in automatic operation.

- The sensing line for first stage pressure transmitter, PT-4-446, which is selected for control, shears off at the connection to the pressure transmitter.
- Several minutes later, the BOP selects PT-4-447 as the controlling channel as directed by the procedure.

Which ONE of the following describes the response of S/G levels assuming S/G level control is maintained in automatic throughout the entire evolution?

All S/G levels will lower from:

A. 50% and stabilize at 40% and then return to 50%.

B. 60% and stabilize at 50% and then return to 60%.

C. 50% continuously until PT-4-447 is selected and then rise to 40%

D. 60% continuously until PT-4-447 is selected and then rise to 50%

Q #44

ANSWER: B

KA: 059A3.02
Ability to monitor automatic operation of the MFW, including programmed levels of the S/G. 2.9/3.1

10CFR55: 41.b.4, 41.b.7

Reference: 5610-T-D-17 Sheet 1
5610-T-D-18A Sheet 1

Cog Level: 3 Analysis
Level 3 because the operator must recognize that when PT-446 is selected for control, it is providing programmed level input to the S/G level control program. A sheared sensing line will cause the pressure transmitter to call for a 0% power S/G level of 50%. At 40% power, the desired programmed level has just increased to 60%. When PT-446 fails low, the programmed level input changes to 50% and not 0 %. Feed reg valves respond and level drops to 50% on all S/Gs. Operator must know that even though failed low, the control loop is limited at 50% level or the level would continue to decrease. They then must realize that when PT-4-447 is selected, the SG level control system will return level back to 60%.

New Question

Response Analysis:

A. Incorrect because S/G levels will lower from 60% when at 40% power and will stabilize at 50% and then return to 60% when PT-4-447 is selected. Plausible because at lower power the levels program level is 50%.

B. Correct per the reference. S/G levels will lower from 60% and stabilize at 50% and then return to 60%.

C. Incorrect because S/G levels will lower from 60% and will stabilize at 50% which is the low level limit, it will not continuously decrease, and it will return to 60% when PT-4-447 is selected not 40%. Plausible because other instrument failures could cause S/G levels to rise continuously until a turbine trip occurs.

D. Incorrect because S/G levels will lower from 60% and will stabilize at 50% which is the low level limit, it will not continuously decrease, and then return to 60% (not 50%) when PT-4-447 is selected. Plausible because other instrument failures (ie. Level faililing high) could cause S/G levels to lower continuously until a reactor trip occurs.

Q #45

With Unit 4 at 30% power during a plant startup, the RO discovers the running Steam Generator Feed Pump (SGFP) start/stop hand switch in the green-flagged position.

Which ONE of the following describes the consequences of this condition?

A. An auto-start signal for the AFW system is disabled.

B. An auto-start signal for the standby condensate pump is disabled.

C. The idle SGFP will NOT auto-start if the running SGFP trips.

D. The SGFP recirculation valves will NOT auto-open if the running SGFP trips.

Q #45

ANSWER: A

KA: 061K4.02

Knowledge of the AFW design feature(s) and/or interlock(s) which provide for: AFW automatic start upon loss of MFW pump, S/G level, blackout or SI. 4.5/4.6

10CFR55: 41.b.4, 41.b.7

Reference: 5610-T-L1, Sheet 15, Notes 1 and 5

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference. An auto-start signal for the trip of the last running MFPto the AFW system has been disabled.

B. Incorrect because the Condensate pump auto-start feature is unaffected by this event. Plausible because Condensate pumps do have auto-start features but they are affected by the status of other Condensate pumps, not SGFPs.

C. Incorrect because the idle SGFP not starting is not a consequence of the green-flag condition. Plausible because the idle SGFP will not auto-start if the running SGFP trips

D. Incorrect because the SGFP recirc valves will auto-open if the running SGFP trips. Plausible because at slightly lower power levels, the recirc valves will have auto-opened even with the SGFP running.

Q #46

Unit 3 is at 100% power with all systems in normal alignment.

The 3C main steam line non-return check valve body ruptures resulting in a large Main Steam Line Break (MSLB) at the 3C non-return check valve.

Which ONE of the following describes the automatic response of the AFW system?

A. Only 3A and 3B AFW pumps start and deliver flow.
390 gpm total AFW flow will be delivered to all S/Gs.

B. Only 3A and 3C AFW pumps start and deliver flow.
780 gpm total AFW flow will be delivered to all S/Gs.

C. Only 3B and 3C AFW pumps start and deliver flow.
390 gpm total AFW flow will be delivered to all S/Gs.

D. All AFW pumps start and deliver flow.
780 gpm total AFW flow will be delivered to all S/Gs.

Q #46

ANSWER: D

KA: 061A3.01
Ability to monitor automatic operation of the AFW, including: AFW startup and flows. 4.2/4.2
10CFR55: 41.b.4, 41.b.7, 41.b.8

Reference: 5613-M-3072, Sheet 1
5610-T-L1 Sheet 11
5610-T-L1 Sheet 15
SD-117, Pages, 10, 17 & 18

Cog Level: 3 Analysis/Application

Level 3 because the operator must analyze the following to come to the correct conclusion. A steam line break at the 3C non-return valve will not cause the 3C S/G to blow dry because the 3C MSIV will close. SI actuates due to Hi steamline flow with low Tavg/ low SG pressure when all 3 S/Gs feed the break at the 3C non-return valve. This SI signal closes all 3 MSIVs. Both trains of AFW get a start signal due to SI. With all 3 S/Gs pressurized, all AFW pumps auto start and provide flow to all S/Gs. The AFW flow controllers are preset at 130 gpm each. 130 gpm X 6 AFW reg valves = 780 gpm.

New Question

Response Analysis:

A. Incorrect because all AFW pumps start and deliver flow. 780 gpm total AFW flow will be delivered to all S/Gs. Plausible if the operator assumes the faulted 3C S/G blows down and 3C S/G is providing steam supply to the 3C AFW pump.

B. Incorrect because all AFW pumps start and deliver flow. Plausible if the operator recognizes 3A and 3C AFW pumps are in different trains. In that case 780 gpm total AFW flow will be delivered to all S/Gs.

C. Incorrect because all AFW pumps start and deliver flow. 780 gpm total AFW flow will be delivered to all S/Gs. Plausible if the operator assumes the faulted 3C S/G blows down. 3A AFW pump would lose its steam supply and 390 gpm total AFW flow would be delivered to all S/Gs.

D. Correct per the references. All AFW pumps start and deliver flow. 780 gpm total AFW flow will be delivered to all S/Gs.

Q #47

Tech Spec 3.8.1.1, AC Power Sources, allows a unit to continue power operation at less than 30% power for up to 30 days if its Startup Transformer becomes inoperable.

Which ONE of the following describes the BASIS for allowing continued operation at less than 30% power?

At 30% power:

A. the two loop low flow / two RCP breaker open reactor trip logic has been instated providing additional reactor protection in the event of a LOOP.

B. S/G pressure is greater than full power S/G pressure providing additional motive force to the steam driven AFW pumps in the event of AFW actuation.

C. fewer components are loaded onto the 4KV Buses and Load Centers resulting in lower bus and load center operating temperatures.

D. decay heat has been reduced, automatic feedwater control can be maintained and the RCPs continue to run.

Q #47

ANSWER: D

KA: 062G2.2.25
As it relates to the AC Electrical Distribution: Knowledge of the bases in Tech Specs for LCOs and safety limits. 2.5/3.7

10CFR55: 41.b.1, 41.b.5, 41.b.7, 41.b.8

Reference: 0-ADM-536, Page 94; Section 3/4.8.1

Cog Level: 1 Recall

Bank Question

Response Analysis:

A. Incorrect because the basis for allowing continued operation at 30% power is decay heat has been reduced, automatic feedwater control can be maintained and natural circulation conditions are avoided by staying at power and not shutting down. Plausible because at 30% power, the two loop low flow / two RCP breaker open reactor trip logic has been instated.

B. Incorrect because the basis for allowing continued operation at 30% power is decay heat has been reduced, automatic feedwater control can be maintained and natural circulation conditions are avoided by staying at power and not shutting down. Plausible because at 30% power, S/G pressure is greater than full power S/G pressure.

C. Incorrect because the basis for allowing continued operation at 30% power is decay heat has been reduced, automatic feedwater control can be maintained and natural circulation conditions are avoided by staying at power and not shutting down. Plausible because at 30% power, fewer components are loaded onto the 4KV Buses and Load Centers.

D. Correct per the reference

Q #48

Both Units are at 100% power with normal system alignments except for 4D MCC which is out of service.

Subsequently the feeder breaker to 3C MCC trips open, de-energizing 3C MCC.

Which ONE of the following describes the effect on the Vital DC electrical system?

A. 3A DC Bus can only be expected to maintain voltage to shutdown loads above 120 volts for four hours.

B. 3A DC Bus can only be expected to maintain voltage to shutdown loads above 105 volts for two hours.

C. 3B DC Bus can only be expected to maintain voltage to shutdown loads above 120 volts for four hours.

D. 3B DC Bus can only be expected to maintain voltage to shutdown loads above 105 volts for two hours.

Q #48

ANSWER: B

KA: 063K1.03
Knowledge of the physical connection and/or cause-effect relationships between the DC Electrical Distribution and the battery charger and battery. 2.9/3.5

10CFR55: 41.b.4, 41.b.7, 41.b.8

Reference: 5610-T-E-1592 Sheet 1
SD-144, Page 9

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that 4D MCC is the power supply to the 3A2 battery charger and 3C MCC is the power supply to the 3A1 battery charger. Loss of both results in no battery chargers for the 3A DC Bus. The operator must then recall that the 3A battery is sized to maintain voltage to shutdown loads above 105 volts for two hours.

New Question

Response Analysis:

A. Incorrect because 3A DC Bus can only be expected to maintain voltage to shutdown loads only above 105 volts for only two hours. Plausible because it is the 3A DC Bus which is affected.

B. Correct per the reference

C. Incorrect because the 3A DC Bus is the affected bus. Plausible because 120 volts is the approximate normal voltage for all DC buses.

D. Incorrect because the 3A DC Bus is the affected bus. Plausible because 3A DC Bus can only be expected to maintain voltage to shutdown loads above 105 volts for two hours.

Q #49

Unit 3 is in Mode 3 when the input breakers to vital DC buses 3D23 and 3D23A trip open deenergizing the DC buses.

Which ONE of the following describes the effect on the Unit 3 EDG(s)?

A. 3A EDG has lost control and field flashing power.
3A EDG does NOT have black start capability.

B. 3B EDG has lost control and field flashing power.
3B EDG does NOT have black start capability.

C. 3A EDG has lost control and field flashing power.
3A EDG is still black start capable.

D. 3B EDG has lost control and field flashing power.
3B EDG is still black start capable.

Q #49

ANSWER: B

KA: 064K2.03
EDGs - Knowledge of the power supplies to the control power. 2.9/3.3

10CFR55: 41.b.4, 41.b.7, 41.b.8

Reference: 3-ONOP-003.5, Step 3.5 & Attachment 3, Bkr 3D23A-28

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because 3B EDG has lost control and field flashing power. Plausible because 3A EDG does not have black start capability.

B. Correct per the reference

C. Incorrect because 3B EDG has lost control and field flashing power and because 3A EDG does not have black start capability. Plausible because both Unit 4 EDGs have black start capability.

D. Incorrect because 3B EDG does not have black start capability. Plausible because 3B EDG has lost control and field flashing power.

Q #50

Operators are performing the monthly test run of the 3A EDG using 3-OSP-023.1, "Diesel Generator Operability Test."

The BOP is attempting to verify 3A EDG is in LAG.

He momentarily positions the diesel generator voltage regulator in RAISE.

Assuming the 3A EDG is in the LAG, which ONE of the following describes the EDG response and subsequent operator actions required to verify the EDG is in LAG?

3A EDG amps:

A. increased.
Slowly lower EDG voltage until amps stop decreasing and start to increase.
Then slowly raise EDG voltage until amps increase.

B. increased.
Slowly raise EDG voltage until amps stop increasing and start to decrease.
Then slowly lower EDG voltage until amps increase.

C. decreased.
Slowly lower EDG voltage until amps stop decreasing and start to increase.
Then slowly raise EDG voltage until amps decrease.

D. decreased.
Slowly raise EDG voltage until amps stop decreasing and start to increase.
Then slowly lower EDG voltage until amps decrease.

Q #50

ANSWER: A

KA: 064G2.1.23
As it relates to the EDG, ability to perform specific system and integrated plant procedures during all modes of plant operation. 3.9/4.0

10CFR55: 41.b.4, 41.b.7

Reference: 3-OSP-023.1, Step 7.1.2.29.k

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference

B. Incorrect because the operator should subsequently slowly lower EDG voltage until amps stop decreasing. Plausible because 3A EDG amps increased.

C. Incorrect because 3A EDG amps increased. Plausible because the operator should slowly lower EDG voltage until amps stops decreasing.

D. Incorrect because 3A EDG amps increased and because the operator should slowly lower EDG voltage until amps stop decreasing. Plausible because if the EDG is in the LEAD, the subsequent operator action would be to subsequently raise the EDG voltage.

Q #51

Unit 3 is at 100% power with all systems in normal alignment when the following occur;

- Annunciator H 1/4, PRMS HI RADIATION, alarms.
- Annunciator H 1/6, PRMS CHANNEL FAILURE, alarms.
- Steam Generator Liquid Sample Monitor, R-3-19, fail lamp on the PRMS drawer is illuminated
- R-3-19 display and recorder reading are failed HIGH
- R-3-19 WARN lamp is ON and HIGH ALARM lamp is ON.

Which ONE of the following describes the plant response and the correct initial operator response?

A. S/G blowdown does NOT automatically isolate.
Manually secure Blowdown.

B. S/G blowdown does NOT automatically isolate.
Re-align the discharge to the main condenser.

C. S/G blowdown has automatically isolated.
Verify S/G blowdown flow control valves, FCV-6278 A, B, & C and blowdown tank to canal level control valve, LCV-3-6265B are closed.

D. S/G blowdown has automatically isolated.
Verify S/G blowdown isolation valves, MOV-6275 A, B, & C and S/G liquid sample valves MOV-1425/1426/1427 are closed.

Q #51

ANSWER: C

KA: 073A2.02
Ability to (a) predict the impacts of the following malfunctions or operations on the PRMS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: detector failure.
2.7/3.2

10CFR55: 41.b.10, 41.b.11, 41.b.12, 41.b.13

Reference: 3-ONOP-071.2, Step 3 RNO
3-ARP-097.CR, H1/6, Step 2f.

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because S/G blowdown has automatically isolated. Plausible because if blowdown had not automatically isolated, ONOP-071.2 would direct the operator to manually isolate blowdown.

B. Incorrect because S/G blowdown has automatically isolated. Plausible because if blowdown had not automatically isolated, re-aligning the discharge to the main condenser would preclude any chance of subsequent radioactive release to the environment via that blowdown path.

C. Correct per the references. S/G blowdown has automatically isolated. S/G blowdown flow control valves, FCV-6278 A, B, & C and blowdown tank to canal level control valve, LCV-3-6265B have closed..

D. Incorrect because S/G blowdown isolation valves, MOV-6275 A, B, & C and S/G liquid sample valves MOV-1425/1426/1427 are not the correct valves to verify closed. Plausible because of the valve nomenclature (Blowdown Isolation Valves) and because S/G blowdown has automatically isolated.

Q #52

Unit 4 operators are responding to a loss of Intake Cooling Water (ICW).

Which ONE of the following identifies plant conditions that will require operators to trip Unit 4 reactor and turbine?

A. Exciter hot air temperature increases to: 80°C

B. Turbine bearing temperature increases to: 160°F

C. CCW temperature increases to: 130°F

D. TPCW temperature increases to: 105°F

Q #52

ANSWER: C

KA: 076A1.02
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Service Water controls including reactor and turbine building closed cooling water temperatures. 2.6/2.6

10CFR55: 41.b.4, 41.b.5, 41.b.8

Reference: 4-ONOP-019 FO Page
4-ONOP-019, Page 12, Step 10
4-ARP-097.CR, E 9/4, Page 288

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because reactor trip is not required until exciter air temperatures increase beyond 90°C. Plausible because exciter air temperatures should increase during this event.

B. Incorrect because reactor trip is not required until turbine bearing temperatures increase beyond 180°F. Plausible because turbine bearing temperatures should increase during this event.

C. Correct per the references.

D. Incorrect because removing load/reactor trip is not required until TPCW temperatures increase beyond 110°F. Plausible because TPCW temperatures should increase during this event.

Q #53

Unit 3 operators are responding to decreasing Instrument Air (IA) Pressure.

In accordance with 0-ONOP-013, "Loss of Instrument Air", which ONE of the following describes the **PROCEDURAL REQUIREMENTS** for the use of Service Air as backup to the IA System?

Service Air valves may be opened:

A. regardless of IA pressure but only after all available instrument air compressors have been started.

B. if IA pressure drops below 95 psig regardless of the number of available instrument air compressors started.

C. if IA pressure drops below 95 psig and no IA compressors can be started

D. as backup to IA without restrictions associated with IA pressure or starting of available IA compressors.

Q #53

ANSWER: C

KA: 078K1.02
Knowledge of the physical connection and/or cause-effect relationships between the Instrument air and the service air. 2.7/2.8

10CFR55: 41.b.4, 41.b.10

Reference: 0-ONOP-013, Steps 3 and 4

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because Service Air valves may be opened only if IA pressure drops below 95 psig and no IA compressors can be started. Plausible because service air valves may be opened after any available instrument air compressors have been started

B. Incorrect because Service Air valves may be opened only if IA pressure drops below 95 psig and no IA compressors can be started. Plausible because service air valves may be opened if IA pressure drops below 95 psig.

C. Correct per the references. Service Air valves may be opened only if IA pressure drops below 95 psig and no IA compressors can be started.

D. Incorrect because Service Air valves may be opened only if IA pressure drops below 95 psig and no IA compressors can be started. Plausible because service air valves are opened as backup to instrument air.

Q #54

The plant was operating at 100% power when:

- A small break LOCA has occurred.
- SI was manually actuated due to decreasing pressurizer level.
- Phase "A" was NOT manually actuated following the manual SI actuation.
- After the transition to EOP-E-1, the LOCA break size increased and containment pressure increased to 24 psig.
- Phase "B" was NOT manually actuated following the increase in containment pressure.

Based upon the above conditions which ONE of the following describes the status of the containment isolation signals that <u>should have</u> occurred?

A. Only Phase "A" containment isolation

B. Only Phase "B" containment isolation

C. Neither Phase "A" or Phase "B" containment isolations

D. Both Phase "A" and Phase "B" containment isolations

Q #54

ANSWER: D

KA: 103K4.06
Knowledge of the Ctmt design feature(s) and/or interlock(s) which provide for containment isolation system 3.1/3.7

10CFR55: 41.b.7, 41.b.9

Reference: 5610-T-L1 Sheet 11

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that a manual SI does not actuate Phase A. He then must analyze the plant condition to determine that an automatic SI has occurred and that this will actuate a Phase A. If containment pressure increases above 20 psig, a Phase B isolation signal will still be generated even if it is not manually initiated.

New Question

Response Analysis:

A. Incorrect because Phase "A" and Phase "B" containment isolations have automatically actuated. Plausible because Phase "A" containment isolation has occurred.

B. Incorrect because Phase "A" and Phase "B" containment isolations have automatically actuated. Plausible because Phase "B" containment isolation has occurred.

C. Incorrect because Phase "A" and Phase "B" containment isolations have automatically actuated. Plausible if the operator does not realize that manual initiation of Phase A and Phase B are not required if the auto-initiation signals are present.

D. Correct per the reference. Both Phase "A" and Phase "B" containment isolations have automatically actuated

Q #55

Containment Isolation Phase "A" and Phase "B" actuated on Unit 3.

Which ONE of the following describes effects of Phase "A" and Phase "B" actuation and the correct operator response?

Phase "A" caused:

A. CVCS Auxiliary spray to the pressurizer to isolate.
Phase "B" caused CCW to the RCPs to isolate.
Operators will reset both Phase "A" and Phase "B" while performing Attachment 3 of 3-EOP-E-0.

B. CVCS letdown from containment to isolate.
Phase "B" caused CCW to the RCPs to isolate.
Operators will reset Phase "A" while performing Attachment 3 of 3-EOP-E-0 and will reset Phase "B" after transitioning from 3-EOP-E-0.

C. Instrument Air to Containment to isolate.
Phase "B" caused Normal Containment Coolers to trip.
Operators will reset Phase "A" while performing Attachment 3 of 3-EOP-E-0 and will reset Phase "B" after transitioning from 3-EOP-E-0.

D. PRMS R-11 and R-12 samples to isolate.
Phase "B" caused Normal Containment Coolers to trip.
Operators will reset both Phase "A" and Phase "B" while performing Attachment 3 of 3-EOP-E-0.

Q #55

ANSWER: B

KA: 103A2.03
Ability to (a) predict the impacts of the following malfunctions or operations on the Ctmt; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Phase A & B Isolation. 3.5/3.8

10CFR55: 41.b.7

Reference: 3-EOP-E-0, Attachment 3, Step 13
3-EOP-E-3, Steps 13 and 19
5613-M-3047, Sheet 1
5613-M-3030, Sheet 5

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because Phase A did not cause CVCS Auxiliary spray to the pressurizer to isolate and operators will not reset Phase B while still in E-0. Plausible because Phase B caused CCW to the RCPs to isolate and operators will reset both Phase A while performing Attachment 3 of 3-EOP-E-0.

B. Correct per the references. Phase A caused CVCS letdown from containment to isolate. Phase B caused CCW to the RCPs to isolate. Operators will reset Phase A while performing Attachment 3 of 3-EOP-E-0 and will reset Phase B after transitioning from 3-EOP-E-0.

C. Incorrect because Phase A did not cause Instrument Air to Containment to isolate and Phase B did not cause Normal Containment Coolers to trip. Plausible because operators will reset Phase A while performing Attachment 3 of 3-EOP-E-0 and will reset Phase B after transitioning from 3-EOP-E-0.

D. Incorrect because Phase B did not cause Normal Containment Coolers to trip and operators will not reset Phase B while still in E-0. Plausible because Phase A caused PRMS R-11 and R-12 samples to isolate and operators will reset Phase A while performing Attachment 3 of 3-EOP-E-0.

Q #56

Unit 4 is at 100% power at the Beginning of Core Life (BOL) with:

- Control Rods are at D-230.
- Rod control is in automatic

Control Rod H-8 drops into the core:

- After decreasing to 2100 psig, RCS pressure stabilizes at 2235 psig.
- Tavg stabilizes 7°F below Tref.

Which ONE of the following describes the effect of this event on the CVCS system?

Low Pressure Letdown Control valve, PCV-4-145, throttled:

A. OPEN initially and subsequently returned to its normal position. The CVCS demineralizers have absorbed boron resulting in a positive reactivity insertion.

B. OPEN initially and subsequently returned to its normal position. The CVCS demineralizers have released boron resulting in a negative reactivity insertion.

C. CLOSED initially and subsequently returned to its normal position. The CVCS demineralizers have absorbed boron resulting in a positive reactivity insertion.

D. CLOSED initially and subsequently returned to its normal position. The CVCS demineralizers have released boron resulting in a negative reactivity insertion.

Q #56

ANSWER: C

KA: 001K3.01
Knowledge of the effect that a loss or malfunction of the CRDS will have on the CVCS. 2.9/3.0

10CFR55: 41.b.1, 41.b.5

Reference: 3-OP-047, Step 4.10
SD 013, Page 10

Cog Level: 2 Comprehension
Level 2 because the operator will have to analyze that the temporary reduction in RCS pressure caused the letdown pressure upstream of PCV-145 to lower. PCV-145 responded by throttling closed then returning to normal. The operator must also recognize that the reduction in Tavg will result in reduced letdown temperatures. Cooler water through the CVCS demineralizers will result in increased absorption of boron in the demineralizers, resulting in lower boron concentration in the VCT and a subsequent positive reactivity insertion.

New Question

Response Analysis:

A. Incorrect because PCV-145 sensed lower upstream pressure and closed initially and subsequently returned to its normal position. Plausible because cooler letdown temperatures means the CVCS demineralizers have absorbed boron resulting in a positive reactivity insertion.

B. Incorrect because PCV-145 sensed lower upstream pressure and closed initially and subsequently returned to its normal position and because cooler letdown temperatures means the CVCS demineralizers have absorbed boron resulting in a positive reactivity insertion. Plausible because these are consistent and accurate descriptions of PCV-145 response and CVCS demineralizer response for a plant transient in the opposite direction

C. Correct per the reference. PCV-145 will throttle closed initially and subsequently return to its normal position. The CVCS demineralizers have absorbed boron resulting in a positive reactivity insertion.

D. Incorrect because the CVCS demineralizers will absorb more boron resulting in a positive reactivity insertion. Plausible because PCV-145 will throttle closed initially and subsequently return to its normal position.

Q #57

Unit 4 reactor is at 100% power when 4A RCP rotor seizes. The 4A RCP stops rotating instantly.

Which ONE of the following describes the initial effect (prior to the reactor trip) of this event on the Reactor Coolant System?

A. Pressurizer level and pressure will decrease.
DNBR will Increase.

B. Pressurizer level and pressure will decrease.
DNBR will Decrease

C. Pressurizer level and pressure will increase.
DNBR will Decrease.

D. Pressurizer level and pressure will increase.
DNBR will Increase

Q #57

ANSWER: C

KA: 002K6.02
Knowledge of the effect of a loss or malfunction of the following RCS components: RCP, 3.6/3.8

10CFR55: 41.b.2, 41.b.3, 41.b.14

Reference: FSAR Section 14.1.9

Cog Level: 2 Comprehension

Level 2 because the operator must relate the type of RCP failure to the effects on the RCS parameters. He then must analyze how the changing parameters relate to DNBR and determine that even though RCS pressure is increasing, the reduction in core flow causes DNB to occur.

New Question

Response Analysis:

A. Incorrect because pressurizer level and pressure will increase and the DNBR will decrease. Plausible because these parameters are consistent with each other.

B. Incorrect because pressurizer level and pressure will increase. Total core cooling flow will decrease and core damage will occur.

C. Correct per the references. Pressurizer level and pressure will increase and DNBR will decrease.

D. Incorrect because DNBR will decrease. Plausible because Pressurizer level and pressure will increase.

Q #58

Operators are performing a startup on Unit 3 and power is 5% with all pressurizer controls in automatic when the controlling pressurizer level transmitter, LT-3-459A, fails LOW.

Which ONE of the following describes the effect of this failure assuming NO operator action?

Pressurizer level will continuously:

A. decrease.
Letdown isolation will occur when pressurizer level reaches the setpoint.

B. decrease.
The reactor will trip on low pressurizer pressure when the setpoint is reached.

C. increase.
The reactor will trip on high pressurizer level when the setpoint is reached.

D. increase.
Pressurizer PORV(s) will open when the setpoint is reached.

Q #58

ANSWER: D

KA: 011A1.01
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRZ LCS controls including PRZ level and pressure. 3.5/3.6

10CFR55: 41.b.3, 41.b.5

Reference: 5610-T-D –15 Sheet 1
5610-T-D-16B Sheet 1

Cognitive Level: 3 Application / Analysis

Level 3 because the operator must first recognize that the LT-459A signal feeds back to the control loop. When LT-459A indicates level is too low, the control loop will send a signal to charging pumps to speed up. Additionally the LT-459A failure causes letdown isolation. This combination results in rising pressurizer level. If power were above P-7 (10%), the reactor would trip at 92% level. At 5% power, the 92% level trip is not enabled. Level will continue to rise, eventually covering the spray nozzles and taking the RCS water solid. Pressure will rise and PORVs will open at 2335 psig.

New Question

Response Analysis:

A. Incorrect because pressurizer level will continuously increase. Plausible because pressurizer level would decrease if LT-459A failed high instead of low and letdown isolation does normally occur at 14%.

B. Incorrect because pressurizer level will continuously increase. Plausible because pressurizer level would decrease if LT-459A failed high instead of low and the reactor would normally trip on low pressurizer pressure when the pressurizer empties.

C. Incorrect because the reactor will not trip on high pressurizer level at this power level. Plausible because pressurizer level will continuously increase.

D. Correct per the references Pressurizer level will continuously increase. Pressurizer PORV(s) will open when setpoint is reached.

Q #59

Operators are performing a plant start up on Unit 3.

Reactor power is 15%.

Which ONE of the following describes the effect of depressing both "Source Range Less than P-6 Push to Re-instate" pushbuttons?

The NIS source ranges will:

A. re-instate causing a SR Hi Flux reactor trip.

B. re-instate but a SR Hi Flux reactor trip will NOT occur.

C. NOT re-instate and a SR Hi Flux reactor trip will NOT occur.

D. NOT re-instate until power is reduced below 10% when the SRs will automatically trip the reactor.

Q #59

ANSWER: C

KA: 015A4.03
Ability to manually operate and/or monitor in the control room: trip bypasses.
3.8/3.9

10CFR55: 41.b.7

Reference: 5610-T-L1 Sheet 16

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that when power is >10%, the P-10 permissive is enabled and sends a block signal to both the reinstatement of the source ranges and to the source range trip signal. Also, pushing the re-instate pushbuttons does not affect the future automatic operation of the detectors as there is no seal in for these pushbuttons.

New Question

Response Analysis:

A. Incorrect because the NIS source ranges will not reinstate and reactor trip will not occur. Plausible because if power was below P-10, this is the action that would occur.

B. Incorrect because the NIS source ranges will not reinstate. Plausible because reactor trip will not occur.

C. Correct per the references. The NIS source ranges will NOT re-instate and a SR Hi Flux reactor trip will NOT occur.

D. Incorrect because the source ranges will not automatically reinstate and trip the reactor when power drops below 10%. Plausible because the SRs will not reinstate immediately but will reinstate (without trip) when power subsequently drops below P-6.

Q #60

Unit 3 core off-load is in progress when the refueling SRO inside containment reports a spent fuel element has dropped and a large amount of gas bubbles are originating from the damaged element.

- PRMS R-3-12, Cont. Air Gas monitor's countrate increases above setpoint and alarms.
- PRMS R-3-11, Cont. Air Particulate monitor's countrate increases but does NOT reach the alarm setpoint.

Which ONE of the following describes an expected plant response and the required operator response?

A. ONLY Containment Ventilation Isolation should have automatically occurred.
Manually initiate Control Room Ventilation Isolation and verify the isolation alignments as directed by 3-ONOP-033.3, "Accidents Involving New or Spent Fuel."

B. ONLY Control Room Ventilation Isolation should have automatically occurred.
Manually initiate Containment Ventilation Isolation and verify the isolation alignments as directed by 3-ONOP-033.3, "Accidents Involving New or Spent Fuel."

C. NEITHER Containment nor Control Room Ventilation Isolation should have automatically occurred.
Manually initiate both and verify the isolation alignments as directed by 3-ONOP-033.3, "Accidents Involving New or Spent Fuel."

D. BOTH Containment and Control Room Ventilation Isolation should have automatically occurred.
Verify the isolation alignments as directed by 3-ONOP-033.3, "Accidents Involving New or Spent Fuel."

Q #60

ANSWER: D

KA: 034A2.01
Ability to (a) predict the impacts of the following malfunctions or operations on the fuel handling system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: dropped fuel element. 3.6/4.4

10CFR55: 41.b.9, 41.b.10, 41.b.11, 41.b.12

Reference: 5610-T-L1 Sheet 11
3-ONOP-033.3, Steps 2.2, 4.3, 5.1.1.1

Cog Level: 2 Comprehension
The SRO should recognize that bubbles from a dropped assembly are an indication the cladding has been breached. Along with the nitrogen gas bubbles will be gaseous fission products so that when detected by the containment gas monitor, an automatic isolation signal will be generated. He then must recognize that when moving fuel, containment integrity is set and that both the control room and the containment ventilation system isolate on high PRMS signals.

New Question

Response Analysis:

A. Incorrect because both containment and control room ventilation Isolation has automatically occurred. Plausible because containment ventilation Isolation should automatically occur and control room ventilation isolation can be manually initiated.

B. Incorrect because both containment and control room ventilation Isolation has automatically occurred. Plausible because control room ventilation Isolation should automatically occur and containment ventilation isolation can be manually initiated.

C. Incorrect because both containment and control room ventilation Isolation has automatically occurred. Plausible because control room ventilation Isolation and containment ventilation isolation can be manually initiated.

D. Correct per the references. Both Containment and Control Room Ventilation Isolation should automatically occur. Verify the isolation alignments as directed by 3-ONOP-033.3, "Accidents Involving New or Spent Fuel."

Q #61

Unit 4 is in Mode 3 with the MSIVs closed as operators commence a reactor start up.

4A main steam line safety valve, "RV-4-1400", fails open and the 4A S/G rapidly depressurizes.

Which ONE of the following describes the response of the safeguards system to this failure?

Safety Injection will:

A. NOT actuate with the MSIVs closed.

B. actuate when Tavg decreases to 543°F.

C. actuate when the 4A S/G pressure decreases to 485 psig.

D. actuate when the 4A S/G pressure decreases to 900 psig.

Q #61

ANSWER: C

KA: 035K1.14
Knowledge of the physical connection and/or cause-effect relationships between the S/G and the ESF. 3.9/4.1

10CFR55: 41.b.7, 41.b.8

Reference: 5610-T-L1 Sheet 19
5610-T-D-18B Sheet 1

Cog Level: 3 Analysis

Level 3 because the operator must recognize that when a S/G depressurizes, SI usually results due to high steam line ΔP. However with the MSIVs closed the 100 psid differential pressure that normally triggers this SI signal can't be generated because the main steam lines would be depressurized. That's why the main steam header pressure inputs have been nulled at 585 psig so that even with the MSIVs closed, when any S/G's pressure drops to 485 psig, the 100 psid SI actuation logic is made up.

New Question

Response Analysis:

A. Incorrect because SI will actuate when the 4A S/G pressure decreases to 485 psig. Plausible because with the MSIVs closed, the header differential pressure cannot reach the 100 psid normally needed to actuate SI.

B. Incorrect because SI will actuate when the 4A S/G pressure decreases to 485 psig. Plausible because 543°F is an SI setpoint that when reached will make up part of SI logic.

C. Correct per the references. SI will actuate when the 4A S/G pressure decreases to 485 psig

D. Incorrect because SI will actuate when the 4A S/G pressure decreases to 485 psig. Plausible because 900 psig would result in 100 psid at hot zero power that is an actuation signal if the MSIVs were open.

Q #62

3-EOP-E-3, "Steam Generator Tube Rupture," directs operators to use the Steam Dump to Condenser system to initiate a cooldown at maximum rate prior to RCS depressurization.

Which ONE of the following describes how the Reactor Operator will accomplish this cooldown using the Steam Dump to Condenser system?

Place the Mode Selector Switch in:

A. AUTO. Bypass the low Tavg interlock. Place the Hagan controller in MANUAL and use the UP arrow to open the steam dump valves.

B. AUTO. Place the Hagan controller in AUTO and adjust the pot setting to the desired setpoint to open the steam dump valves.

C. MANUAL. Bypass the low Tavg interlock. Place the Hagan controller in MANUAL and use the UP arrow to open the steam dump valves.

D. MANUAL. Place the Hagan controller in MANUAL and adjust the pot setting to the desired setpoint to open the steam dump valves.

Q #62

ANSWER: C

KA: 041G2.1 .28

As it relates to the SD Sys: Knowledge of the purpose and function of major system components and controls. 3.2/3.3

10CFR55: 41.b.4, 41.b.7

Reference: 3-EOP-E-3, Step 19
SD-105 Page 17
5610-T-L1, Sheet 22A

Cog Level: 2 Comprehension
Level 2 because the operator must understand all the operating modes of the Hagan controller and EOP-E-3, Step 19 does not provide specific guidance regarding how to use the SDTC system to achieve the desired results. As stated in the correct response, this is a several step process and requires the operator to determine how the controller responds in various modes of operation, this particular evolution requires the controller to be in both the manual mode and manual control of the hagan process output (manual-manual mode). The operator must also understand that this action would result in the SDTC valves closing if he did not also bypass the low Tavg interlock.

New Question

Response Analysis:

A. Incorrect because the Mode Selector Switch will be placed in MANUAL. Plausible because the Hagan controller will be placed in MANUAL and the UP arrow will be used to open the steam dump valves.

B. Incorrect because the Mode Selector Switch will be placed in MANUAL and the Hagan controller will be place in MANUAL. Plausible because placing the Hagan controller in AUTO and adjusting the pot setting would open the steam dump valves if the Mode Selector Switch were placed in MANUAL.

C. Correct per the references. Operators will place the Mode SS in MANUAL. Bypass the low Tavg interlock. Place the Hagan controller in MANUAL and use the UP arrow to open the steam dump valves.

D. Incorrect because the Hagan controller will be place in MANUAL. Plausible because the Mode Selector Switch will be placed in MANUAL

Q #63

Unit 3 is at 100% power when the steam jet air ejector common steam supply valve, 3-30-020, is inadvertently closed.

Which ONE of the following describes the effect of closing valve 3-30-020?

Assume no other operator action occurs.

A. Condenser vacuum will decrease.
Turbine exhaust hood temperatures will decrease
Turbine efficiency will decrease

B. Condenser vacuum will decrease.
Main generator megawatts will decrease
Turbine exhaust hood temperatures will increase

C. Tavg will increase
Turbine exhaust hood temperatures will decrease
Turbine efficiency will decrease

D. Tavg will increase.
Main generator megawatts will increase
Turbine exhaust hood temperatures will increase

Q #63

ANSWER: B

KA: 055K3.01

Knowledge of the effect that a loss or malfunction of the CARS will have on the main condenser. 2.5/2.7

10CFR55: 41.b.5, 41.b.7
Reference: 5613-M-3014, Sheet 3
3-ONOP-014, Step 2.1.2,
3-ARP-097.CR E 5/2
Gen Physics, PWR Components Ch. 3 Heat Exchangers & Condensers Pages 13, 15, & 16

Cog Level: 2 Comprehension
Level 2 because the operator must realize that closing valve 3-30-020 will stop the steam supply to the CARS which in turn will allow air to flow backwards through the SJAE into the condenser which will result in condenser vacuum decreasing and turbine exhaust hood temperature increasing. The operator must then relate the operation of the air ejector to the operation of the condenser and then predict those effects on turbine efficiency and megawatts.

New Question

Response Analysis:

A. Incorrect because turbine exhaust hood temperatures will increase. Plausible because condenser vacuum will decrease and turbine efficiency will decrease

B. Correct per the references. Condenser vacuum will decrease. Main generator megawatts will decrease. Turbine exhaust hood temperatures will increase.

C. Incorrect because turbine exhaust hood temperatures will increase. Plausible because Tavg will increase and turbine efficiency will decrease

D. Incorrect because main generator megawatts will increase. Plausible because Tavg will increase and Turbine exhaust hood temperatures will increase

Q #64

Unit 3 is at 75% power with all systems in normal alignment when the following occurs:

- Annunciator D 5/3, SGFP A SUCTION LO PRESS, alarms
- Annunciator D 7/4, LP HEATER BYPASS OPEN, alarms
- CV-3-2011 indicates open
- a turbine runback is NOT in progress

Which ONE of the following correctly describes the FIRST operator response in accordance with 3-ARP-097.CR?

A. Close CV-3-2011 if SGFP suction pressure is greater than 220 psig.

B. Reduce turbine load to restore SGFP suction pressure.

C. Start the standby Condensate Pump to restore SGFP suction pressure.

D. Dispatch an operator to bypass the Condensate Polishing demineralizers.

Q #64

ANSWER: C

KA: 056G2.4.50
As it relates to the condensate system: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. 3.3/3.3

10CFR55: 41.b.4

Reference: 3-ARP-097.CR, D 7/4 Step 1 & 3.b.
3-ARP-097.CR, D 5/3 Step 2 & 3.a.

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the ARP directs operators to start the standby Condensate Pump to restore SGFP suction pressure to > 220 psig. Plausible because closing CV-2011 would help to restore SGFP suction pressure.

B. Incorrect because the ARP directs operators to start the standby Condensate Pump to restore SGFP suction pressure to > 220 psig. Plausible because reducing turbine load would help to restore SGFP suction pressure.

C. Correct per the references. The RO will start the standby Condensate Pump to restore SGFP suction pressure to greater than 220 psig.

D. Incorrect because the ARP directs operators to start the standby Condensate Pump to restore SGFP suction pressure to > 220 psig. Plausible because bypassing the Condensate Polishing demineralizers would improve SGFP suction pressure.

Q #65

Chemistry has reported that the concentration of Oxygen in the in-service gas decay tank (GDT) is 4.2% and the Hydrogen concentration is 4.8%.

Which ONE of the following describes the correct operator response?

Stop addition of waste gas to the gas decay tank and:

A. place the affected GDT tank in the "standby" position.

B. pressurize the affected GDT with Nitrogen and release the GDT IAW release permit as soon as possible.

C. vent the affected GDT to the vent header to remove excess Oxygen.

D. cross tie the affected GDT with the standby GDT to reduce the Oxygen concentration.

Q #65

ANSWER: B

KA: 071K5.04
Knowledge of the operational implications of the following concept as it applies to the WGD system: relationship of H2/O2 concentrations to flammability. 2.5/3.1

10CFR55: 41.b.10, 13

Reference: 0-ONOP-061, NOTE prior to Step 5 & steps 5 thru end

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because ONOP-061 directs operators to reduce the oxygen concentration to less than flammability limits by isolating the tank and pressurizing it with Nitrogen and then releasing it if the O2 and H2 concentrations are in this flammability range. Standby could automatically place the tank back in service if the in-service tank pressure got high enough.

B. Correct per the reference.

C. Incorrect because ONOP-061 directs operators to reduce the oxygen concentration to less than flammability limits by isolating the tank and pressurizing it with Nitrogen and then releasing it if the O2 and H2 concentrations are in this flammability range. Venting to vent header would only recirculate the flow from the compressors back to the tank and have no effect.

D. Incorrect because ONOP-061 directs operators to reduce the oxygen concentration to less than flammability limits by isolating the tank and pressurizing it with Nitrogen and then releasing it if the O2 and H2 concentrations are in this flammability range. Although this would reduce the concentrations, it is not allowed by procedures.

Q #66

The following conditions exist on Unit 3.

- Unit 3 is at 90% power.
- Tavg = 630°F
- RCS pressure is 2235 psig

Which ONE of the following describes the required operator response?

A. Place the unit in Mode 3 within 1 hour.

B. Reduce Tavg to less than 625°F within 15 minutes.

C. Reduce power to less than 75% within 15 minutes

D. Reduce RCS pressure to less than 2235 psig within 5 minutes.

REFERENCE PROVIDED

Q #66

ANSWER: A

KA: G.2.1.11
Knowledge of less than one hour technical specification action statements for systems. 3.0/3.8

10CFR55: 41.b.5

Reference: TS 2.1.1
TS Figure 2.1-1

Provide as reference: Tech Spec Figure 2.1-1

Cog Level: 2 Comprehension
Level 2 because the applicant must plot the provided values on the given curve and then evaluate if the Safety Limit has been violated and then recall the required corrective actions. Note that the given curve has 3 parameters that have to be evaluated and the loci of the parameters lies between the labeled Acceptable and Unacceptable regions. The applicant has to judge, based on the applicable pressure curve, that the point location is unacceptable.

New Question

Response Analysis:

A. Correct per the reference. A Safety Limit has been violated. Place the unit in Mode 3 within 1 hour.

B. Incorrect because the TS required response is to shutdown within 1 hour. Plausible because reducing Tavg to less than 625°F would restore conditions to within the acceptable operating region and because there are other short term Tech Specs that require a 15 minute response.

C. Incorrect because the TS required response is to shutdown within 1 hour. Plausible because reducing power to less than 75% would restore conditions to within the acceptable operating region and because there are other short term Tech Specs that require a 15 minute response.

D. Incorrect because the TS required response is to shutdown within 1 hour. Plausible because reducing pressure within 5 minutes is a required action if the other PTN Safety Limit (press >2735 psig) is violated.

Q #67

Operators have evacuated the Control Room.

The Unit 3 RO is performing Attachment 3 of 0-ONOP-105, "Control Room Evacuation" and has determined that RCS boration is required.

Which ONE of the following describes the correct orders the RO should give the SNPO to successfully borate the RCS?

"Locally open the:

A. Emergency Boration Valve, MOV-3-350. After I start the 3C Charging pump, I will direct you to increase the 3C Charging pump speed controller setpoint to 6 psig."

B. Emergency Boration Valve, MOV-3-350. After I start the 3B Charging pump, I will direct you to increase the 3B Charging pump speed controller setpoint to 12 psig."

C. Manual Boration Valve, 3-356. After I start the 3B Charging pump, I will direct you to increase the 3B Charging pump speed controller setpoint to 6 psig."

D. Manual Boration Valve, 3-356. After I start the 3C Charging pump, I will direct you to increase the 3C Charging pump speed controller setpoint to 12 psig."

Q #67

ANSWER: B

KA: G.2.1.8

Conduct of Operations: Ability to coordinate personnel activities outside the control room. 3.8/3.6

10CFR55: 41.b.7, 41.b.10

Reference: 0-ONOP-105, Attachment 3, Page 65, Step 23

Cognitive Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the 3C Charging pump is the wrong pump (it will have no power) and the SNPO should increase the Charging pump speed controller setpoint to 12 psig. Plausible because MOV-350 is the correct valve to open and 6 psig is the initial charging pump controller setting.

B. Correct per the references

C. Incorrect because valve 3-356 is the wrong valve and the SNPO should increase the Charging pump speed controller setpoint to 12 psig.. Plausible because 3-356 is a manual emergency boration valve used for boration under different circumstances and 6 psig is the initial charging pump controller setting and 3B Charging pump is the correct pump.

D. Incorrect because valve 3-356 is the wrong valve and the 3C Charging pump is the wrong pump (it will have no power) Plausible because 3-356 is a manual emergency boration valve used for boration under different circumstances and because 12 psig is the correct charging pump controller setting.

Q #68

Which ONE of the following is an accurate comparison of the Unit 3 SFP radiological monitoring system to the Unit 4 SFP radiological monitoring system?

A gaseous radioactive release from:

A. both SFPs are monitored by their own separate Unit 3 and Unit 4 SFP SPING detectors located in each SFP vent duct.

B. both SFPs are monitored by a common SFP SPING located in the SFP common vent duct.

C. Unit 3 SFP is monitored by the plant vent monitor while Unit 4 SFP is monitored by a separate U4 SFP SPING.

D. Unit 4 SFP is monitored by the plant vent monitor while the Unit 3 SFP is monitored by a separate U3 SFP SPING.

Q #68

ANSWER: D

KA: G.2.2.4
Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility. 2.8/3.0

10CFR55: 41.b.11

Reference: SD-041 Page 20, SD-068 Page 33,
5614-M-3034, Sheet 1, 5610-M-3060 Sheet 1, 5613-M-3034 Sheet 1,

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because a gaseous radioactive release from both SFPs is monitored differently. Plausible because only unit 4 is vented to the plant vent while unit 3 has a SPING detector in its vent duct.

B. Incorrect because a gaseous radioactive release from both SFPs is monitored differently. Plausible because only unit 4 is vented to the plant vent while unit 3 has a SPING detector in its vent duct.

C. Incorrect because a gaseous radioactive release from both SFPs is monitored differently. Plausible because only unit 4 is vented to the plant vent while unit 3 has a SPING detector in its vent duct.

D. Correct per the references. Unit 4 SFP is monitored by the plant vent monitor while the Unit 3 SFP is monitored by a separate U3 SFP SPING.

Q #69

Which ONE of the following temporary alterations would require a "prior PNSC approved Temporary System Alteration (TSA)"?

A. lifting of a wire to perform a troubleshooting procedure on a circuit associated with turbine runback logic.

B. addition of a jumper in the start circuit of the 3A HHSI Pump which will remain OOS on an ECO while the jumper is in place.

C. addition of a temporary power supply for a Phase A Containment Isolation actuation circuit until a permanent power supply can be obtained.

D. installation of drain rigs on the pressurizer in preparation for fill and vent following refueling.

Q #69

ANSWER: C

KA: G.2.2.11
Knowledge of the process for controlling temporary changes. 2.5/3.4

10CFR55: 41.b.10

Reference: ADM-503, Step 5.1.4, Step 5.6.1.1
ADM-503, Att. 1, Page 1

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because lifting of a wire to perform troubleshooting on a circuit is specifically excluded from requiring a TSA by ADM-503 (Ref. Step 4.1.2.5). Plausible because lifting a wire is a temporary alteration.

B. Incorrect because addition of a jumper in a circuit of a component which will remain OOS on an ECO while the jumper is in place is specifically excluded from requiring a TSA by ADM-503 (Ref. Step 4.1.5.9). Plausible because adding a jumper to a circuit is a temporary alteration.

C. Correct per the references. Addition of a temporary power supply for a Phase A Containment Isolation actuation circuit until a permanent power supply can be obtained requires a prior PNSC approved TSA.

D. Incorrect because installation of drain rigs connected to floor drains is specifically excluded from requiring a TSA by ADM-503 (Ref. Step 4.1.2.1). Plausible because installing a drain rig is a temporary alteration.

Q #70

Refueling core off-load is being conducted on Unit 3.

The following off-load data has been recorded:

Time	Cumulative # of fuel elements off-loaded	SFP temperature
0800	0	138°F
0900	3	138°F
1000	9	139°F
1100	15	139°F
1200	22	141°F
1300	30	142°F
1400	37	147°F
1500	47	151°F

Which ONE of the following identifies the FIRST time when core off-load should have been stopped as required by 3-OP-040.2, "Refueling Core Shuffle"?

A. 1200

B. 1300

C. 1400

D. 1500

Q #70

ANSWER: A

KA: G.2.2.28
Knowledge of new and spent fuel movement procedures. 2.6/3.5

10CFR55: 41.b.1, 41.b.11, 41.b.13

Reference: 3-OP-040.2, Steps 4.5 and 4.6

Cog Level: 1 recall

New Question

Response Analysis:

A. Correct because the SFP temperature increased to 141°F at 1200. This exceeds the OP-040.2 limit of 140°F.

B. Incorrect because the off-load should have been stopped at 1200. Plausible because the cumulative off-load limit and the instantaneous off-load limits have been reached at 1300.

C. Incorrect because the off-load should have been stopped at 1200. Plausible because the cumulative off-load limit has been exceeded at 1400.

D. Incorrect because the off-load should have been stopped at 1200. Plausible because the instantaneous off-load limit has been exceeded at 1500.

Q #71

A plant worker is assigned to work in a radiation field under the following conditions:

- The job is located 2 meters from a 1" valve that is reading 60 mr/hr at 1 meter distance.
- Additionally, the job location general area dose rate from other radiation sources is exactly equal to the 10CFR20 minimum dose rate that defines a Radiation Area.
- The operator's cumulative documented dose for the year is 940 mrem.
- An extension of the exposure guidelines has NOT been granted.

Determine the MAXIMUM number of hours he may work without receiving a dose extension?

A. 1 hr

B. 2 hrs

C. 3 hrs

D. 4 hrs

Q #71

ANSWER: C

KA: G.2.3.1
Knowledge of 10CFR20 and related facility radiation control requirements. 2.6/3.0

10CFR55: 41.b.12

Reference: 0-ADM-600, Section 5.7.1.4
10CFR20 – Radiation Area Definition

Cog Level: 3 Analysis

Level 3 because the operator must recall the administrative limits and then calculate the remaining stay time by determining the total dose rate. The operator must recognize to use the inverse square law to calculate that the valve reading 60 mr/hr at 1 meter will cause a 15 mr/hr dose rate at the 2 meter work location. However, the operator must recognize that the general area dose (10CFR20 dose rate = 5 mr/hr minimum for Rad Area) needs to be added as well as the worker is also exposed to this. This will allow 3 hours of stay time before exceeding the 1000 mr guideline. Administrative Limit is 1000 mr/yr without an extension. Operator has 60 mr remaining exposure.

New Question

Response Analysis:

A. Incorrect-plausible if you improperly calculate the 60 mr/hr at 1 meter remains constant out to 2 meters (plane source calculation).

B. Incorrect-plausible if you do not account for the inverse square law and only reduce the dose by ½ (30 mr/hr) instead of ¼ (a common mistake)

C. Correct - the 15 mr/hr from the valve is added to the 5 mr/hr general area dose rate to have 20 mr/hr total resulting in 3 hours of stay time.

D. Incorrect because the dose from the valve at 2 meters is 15 mr/hr but the general area dose rate must be added to it.

Q #72

Given the following conditions at a work site:

- Radiation level is 40 mrem/hr
- Radiation level with shielding is 10 mrem/hr
- Time for one worker to place shielding is 15 minutes
- Time to conduct the task with one worker is 1 hour.
- Time to conduct the task with 2 workers is 20 minutes.

Assumptions:

- If shielding is used, it is installed by one worker only and left in place.
- The worker placing shielding will be exposed to a dose rate of 40 mr/hr.

Which ONE of the following would result in the lowest total whole body dose?

A. Conduct the task with two workers with shielding.

B. Conduct the task with two workers without shielding

C. Conduct the task with one worker with shielding.

D. Conduct the task with one worker without shielding.

Q #72

ANSWER: A

KA: G.2.3.2
Knowledge of facility ALARA program. 2.5/2.9

10CFR55: 41.b.9, 41.b.12, 41.b.13

Reference: 0-ADM-600, Step 5.1.1.2

Cognitive Level: 3 Application / Analysis

Level 3 because the operator must recall the ALARA rule which calls for the total collective exposure to be minimized. Then the operator must calculate the collective exposure for each option and choose the alternative with the lowest total collective exposure.

Bank Question

Response Analysis:

A. correct because the total dose would be 10 mr to the worker placing the shielding plus 3.3 mr to each worker resulting in 16.6 total mr.

B. incorrect because each worker receives 13.3 mr for a total dose of approximately 26.6 mr.

C. incorrect because the worker would receive 20 mrem. (10 mrem while placing the shielding and 10 mr while performing the work).

D. Incorrect because this would result in one worker receiving 40 mr.

Q #73

An operator has volunteered to be a member of an Emergency Response Team that will enter a high radiation area to rescue a person from a non-life-threatening situation.

- The operator has already received 2 REM Total Effective Dose Equivalent (TEDE) this year.
- The dose projection for each team member for this rescue is 4 REM TEDE.

Which ONE of the following is correct regarding this situation?

The operator may:

A. NOT be part of the rescue team.
If the operator participated, the additional 4 REM would exceed the annual 10CFR20 limit but would NOT exceed the allowable exposure limit of Enclosure 1 of 0-EPIP-20111, "Re-Entry".

B. NOT be part of the rescue team.
If the operator participated, the additional 4 REM would exceed the annual 10CFR20 limit and would exceed the allowable exposure limit of Enclosure 1 of 0-EPIP-20111, "Re-Entry".

C. be part of the rescue team.
The additional 4 REM will NOT exceed the annual 10CFR20 limit and will NOT exceed the allowable exposure limit of Enclosure 1 of 0-EPIP-20111, "Re-Entry".

D. be part of the rescue team.
The additional 4 REM will exceed the annual 10CFR20 limit but will NOT exceed the allowable exposure limit of Enclosure 1 of 0-EPIP-20111, "Re-Entry".

Q #73

ANSWER: D

KA: G.2.3.4

Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. 2.5/3.1

10CFR55: 41.b.12

Reference: 0-EPIP-20111, Step 5.1.1.1, 5.1.1.4, 5.1.1.8, Enclosure 1
10CFR20.1201

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the operator may be a member of the team in spite of violating the 10CFR20 limits. Plausible because the annual 10CFR20 limit will be exceeded and the EPIP-20111 limit of 10 REM will not be exceeded.

B. Incorrect because the operator may be a member of the team and the additional 4 REM would not violate the EPIP limit of 10 REM. Plausible because the annual 10CFR20 limit will be exceeded.

C. Incorrect because the 10CFR20 limits will be violated. Plausible because the operator may be a member of the team and the EPIP-20111 limit of 10 REM will not be violated.

D. Correct because the operator may be a member of the team in spite of violating the 10CFR20 limits. The EPIP-20111 limit of 10 REM will not be violated.

Q #74

Unit 4 tripped from 100% power.

The following conditions are observed by the control room operators upon completion of 4-EOP-E-0:

▪ Steam Generator narrow range levels:	off-scale low
▪ Steam Generator pressures:	800 psig
▪ 4A S/G AFW flow rate:	100 gpm
▪ 4B S/G AFW flow rate:	125 gpm
▪ 4C S/G AFW flow rate:	125 gpm
▪ Pressurizer level:	off-scale low
▪ RCS pressure:	600 psig
▪ RCS Cold Leg temperatures:	330°F
▪ Containment pressure:	16 psig

Which ONE of the following procedures should the operators transition to?

A. 4-EOP-E-1, "Loss of Reactor or Secondary Coolant"

B. 4-EOP-E-2, "Faulted Steam Generator Isolation"

C. 4-EOP-FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition"

D. 4-EOP-FR-H.1, "Response to Loss of Secondary Heat Sink"

Q #74

ANSWER: A

KA: G.2.4.4
Ability to recognize abnormal indications for system operating parameters which are entry level conditions for emergency and abnormal operating procedures. 4.0/4.3

10CFR55: 41.b.10

Reference: 4-EOP-E-0, Step 15
4-EOP-F-0, Enclosures 3 and 4

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that a LOCA exists and a secondary break does not. The Operator must then apply the criteria of EOP-F-0 to determine that a red or orange path does not exist for heat sink or integrity.

New Question

Response Analysis:

A. Correct per the references. Operators should transition to 4-EOP-E-1, "Loss of Reactor or Secondary Coolant when 4-EOP-E-0 is complete because a LOCA exists and the entry criteria for FR-P.1 and FR-H.1 are not yet met.

B. Incorrect because a LOCA exists and the correct transition is to EOP-E-1, not EOP-E-2. Plausible because S/G pressures are lower than expected for the post-trip condition and containment pressure is at a value that can be caused by a MSLB.

C. Incorrect because a LOCA exists and the correct transition is to EOP-E-1, not EOP-FR-P.1. Plausible because RCS cold leg temperatures are above the threshold value of 320°F that would force transition to FR-P.1.

D. Incorrect because a LOCA exists and the correct transition is to EOP-E-1, not EOP-FR-H.1. Plausible because S/G NR levels are off-scale low and AFW flow rates are barely above the threshold value of 345 psig that would force transition to FR-H.1.

Q #75

Operators are performing 3-EOP-E-1, "Loss of Primary or Secondary Coolant" when the following conditions are noted:

- Containment temperature: 230°F
- Average CET temperature: 755°F
- Containment pressure: 25 psig
- Pressurizer level: Off-scale low
- NIS IR N-35 & N-36 power: 3×10^{-9} amps and increasing
- Gamma metrics power 5×10^{2} cps and stable

Which ONE of the following describes the correct operator response?

Immediately transition to:

A. 3-EOP-FR-Z.1, "Response to High Containment Pressure."

B. 3-EOP-FR-S.1, "Response to Nuclear Power Generation/ATWS."

C. 3-EOP-FR-I.2, "Response to Low Pressurizer Level."

D. 3-EOP-FR-C.2, "Response to Degraded Core Cooling."

Q #75

ANSWER: D

KA: G.2.4.5
Knowledge of the organization of the operating procedures network for normal, abnormal and emergency evolutions. 2.9/3.6

10CFR55: 41.b.10

Reference: 3-EOP-F-0, Enclosures 1, 2, 5, 6, Attachment 1 - Pages 1 & 2

Cognitive Level: 2 Comprehension
Level 2 because the operator must evaluate the conditions given to determine the highest priority condition and associated procedure. The question is made more difficult by the fact that it appears that an orange path on subcriticality exists but with adverse containment conditions, an orange path on subcriticality does not actually exist.

New Question

Response Analysis:

A. Incorrect because the operators should transition to FR-C.2 because an orange path on core cooling has priority over an orange path on containment. Plausible because the containment conditions do meet the criteria for an orange path and the transition to FR-Z.1 is the usual transition operators will make under these circumstances.

B. Incorrect because the operators should transition to FR-C.2 because an orange path on core cooling exists. Plausible because it appears that an orange path on subcriticality exists when the operator observes the IR power increasing. However, adverse conditions exist and the operator should rely on gammametrics which are stable.

C. Incorrect because the operators should transition to FR-C.2 because an orange path on core cooling exists. Plausible because pressurizer level is off-scale low which represents a yellow path on inventory.

D. Correct per the reference. The operator should transition to FR-C.2 in response to the highest orange path which exists at the time.

Final Submittal

(Blue Paper)

Senior Operator Written Examination

Q #76

The Unit Supervisor is briefing the crew in preparation for starting an RCP as directed by 3-EOP-ES-1.2, "Post LOCA Cooldown and Depressurization."

Primary system parameters are:

- PRZ Level: 73%
- RVLMS Plenum Level: Full
- RVLMS Head Level: NOT Full

Which ONE of the following describes the effect on pressurizer level when an RCP is started under these conditions and the correct procedure path the Unit Supervisor should take?

Pressurizer level will:

A. drop when an RCP is started.
Transition to 3-EOP-FR-I.3, "Response to Voids in Reactor Vessel."

B. NOT be affected when an RCP is started.
Transition to 3-EOP-FR-I.3, "Response to Voids in Reactor Vessel."

C. drop when an RCP is started.
Continue to implement 3-EOP-ES-1.2.

D. NOT be affected when an RCP is started.
Continue to implement 3-EOP-ES-1.2.

Q #76

ANSWER: C

KA: 000009EA2.04
Able to determine and interpret the following as they apply to Small Break LOCA: PRZ Level. 3.8/4.0

10CFR55: 43.b.5

Reference: 3-EOP-ES-1.2, Step 25 and BD
3-EOP-F-0, Enclosure 6
3-EOP-FR-I.3, CAUTION prior to Step 1

Cog Level: 2 Analysis
Level 2 because the operator must determine that the RVLMS and pressurizer level indications indicate a void in the vessel head and predict that starting an RCP will collapse the void, lowering the pressurizer level. The operator must recall that starting an RCP is desirable in these circumstances to provide forced cooling and normal pressure control during the cooldown. Finally these conditions are to be expected and there is no need to transition to the identified yellow path procedures. Additionally FR-I.3 should not be implemented when SI pumps are operating.

New Question

Response Analysis:

A. Incorrect because FR-I.3 should not be implemented when SI pumps are operating. Plausible because pressurizer level will drop when an RCP is started as coolant flow to the head region collapses the void, lowering the pressurizer level.

B. Incorrect because pressurizer level will drop when an RCP is started as coolant flow to the head region collapses the void, lowering the pressurizer level. Plausible because a transition to FR-I-3 would address the head void. Additionally the operator must recognize FR-I.3 should not be implemented when SI pumps are operating.

C. Correct per the reference

D. Incorrect because pressurizer level will drop when an RCP is started as coolant flow to the head region collapses the void, lowering the pressurizer level. Plausible because the operators should continue to implement 3-EOP-ES-1.2.

Q #77

3-EOP-ECA-2.1, "Uncontrolled Depressurization of All Steam Generators," directs operators to control feed flow to minimize RCS cooldown.

RCS cold leg temperatures have decreased from 547°F to 340°F in the past 60 minutes.

Which ONE of the following describes the correct operator response?

A. Decrease feed flow to 345 gpm.
Transition to 3-EOP-FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition."

B. Decrease feed flow to 25 gpm to each S/G.
Transition to and complete 3-EOP-FR-H.1, "Response to Loss of Secondary Heat Sink."

C. Continue to implement 3-EOP-ECA-2.1. Decrease feed flow to 25 gpm to each S/G.

D. Continue to implement 3-EOP-ECA-2.1. Decrease total feed flow to 345 gpm.

Q #77

ANSWER: C

KA: W/E12EA2.2
Able to determine and interpret the following as they apply to Uncontrolled Depressurization of all S/Gs: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments. 3.4/3.9

10CFR55: 43.b.1 & b.5

Reference: 3-EOP-ECA-2.1, Step 3
3-EOP-F-0, Enclosure 4
3-EOP-FR-H.1, CAUTION prior to Step 1

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that with a cool down > 100°F/hour, ECA-2.1 will require feed flow to be reduced to 25 gpm per S/G. This reduction in feed flow will result in a red path on heat sink, but because the reduction of feed flow was procedurally driven, performance of FR-H.1 is not desirable.

New Question

Response Analysis:

A. Incorrect because RCS temperatures have not dropped far enough to trigger an orange path on Integrity and feed flow should be reduced to 25 gpm per S/G. Plausible because RCS temperatures have dropped 227°F in the past 60 minutes which is a condition which normally may lead to transition to FR-P.1.

B. Incorrect because transition to FR-H.1 is not required because feed flow has been reduced due to procedural requirements. Plausible because operators will decrease feed flow to 25 gpm to each S/G.

C. Correct per the reference. Operators should continue to implement 3-EOP-ECA-2.1 and decrease feed flow to 25 gpm to each S/G.

D. Incorrect because feed flow needs to be reduced to 25 gpm to each S/G as directed by EOP-ECA-2.1. Plausible because operators will continue to implement 3-EOP-ECA-2.1.

Q #78

Unit 4 is at 100% power with all systems in normal alignment.

The Unit Supervisor has directed operators to remove the 4A CCW pump from service.

- The 4A CCW pump CS has been placed in Pull-to-Lock but its breaker is still racked in.
- The switchyard subsequently de-energizes.

Which ONE of the following correctly describes Unit 4 sequencer(s) response and the FIRST procedure the Unit Supervisor will use to verify correct CCW system alignment?

A. 4A sequencer will close the 4C CCW pump breaker.
4B sequencer will close the 4B CCW pump breaker.
4-EOP-ES-0.1, "Reactor Trip Response."

B. 4A sequencer will close the 4C CCW pump breaker.
4B sequencer will close the 4B CCW pump breaker.
4-ONOP-004, "Loss of Offsite Power."

C. 4A sequencer will attempt to close the 4A CCW pump breaker.
4B sequencer will close the 4B CCW pump breaker.
4-EOP-ES-0.1, "Reactor Trip Response."

D. 4A sequencer will attempt to close the 4A CCW pump breaker.
4B sequencer will close the 4C CCW pump breaker.
4-ONOP-004, "Loss of Offsite Power."

Q #78
ANSWER: C

KA: 000056AA2.47 - Able to determine and interpret the following as they apply to Loss of Off-site Power: Proper operation of the EDG load sequencer. 3.8/3.9

10CFR55: 43.b.5

Reference: 4-EOP-ES-0.1, Step 17
4-ONOP-004, First NOTE prior to Step 1
5614-T-L1, Sheet 12A & 12B,
5610-T-L1, Sheet 124D
5610-T-L1, Sheet 152A

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that if the 4A CCW pump is in PTL it cannot start. If the 4A CCW pump breaker has not been racked out, the 4A sequencer will still try to close its breaker in the event of a LOOP. 4C CCW pump can be started by either sequencer depending on the alignment of 4D bus. However if both 4A and 4B CCW pumps are racked in, 4C CCW pump will not get a start signal from a sequencer. Operators will transition from EOP-E-0 to EOP-ES-0.1 in response to the reactor trip caused by the LOOP. ES-0.1, Step 17 is the first procedural opportunity to verify proper CCW operation. Note that it is checked a second time in ONOP-004 after operators complete ES-0.1.

New Question

Response Analysis:

A. Incorrect because 4A sequencer will attempt to close the 4A CCW pump breaker. Plausible because 4B sequencer will close the 4B CCW pump breaker and operators will verify the CCW alignment first using 4-EOP-ES-0.1, "Reactor Trip Response."

B. Incorrect because 4A sequencer will attempt to close the 4A CCW pump breaker and operators will verify the CCW alignment first using 4-EOP-ES-0.1, "Reactor Trip Response." Plausible because 4B sequencer will close the 4B CCW pump breaker

C. Correct per the reference

D. Incorrect because 4B sequencer will close the 4B CCW pump breaker and operators will verify the CCW alignment first using 4-EOP-ES-0.1, "Reactor Trip Response." Plausible because 4A sequencer will attempt to close the 4A CCW pump breaker.

Q #79

Unit 3 is at 75% power when the following occur:

- Automatic VCT makeup STARTS with VCT level at 50% on LT-112.
- 3B main feedwater flow control valve transfers to MANUAL mode.
- QSPDS channel "A" is DEENERGIZED
- Train 1 AFW flow control valves fail CLOSED

After completion of any immediate operator actions and with the plant stable, the US should;

A. Restore 3A EDG to service within 72 hours or initiate a plant shutdown to reach Mode 3 within the following 6 hours.

B. Restore 3P07 to service within 1 hour or initiate a plant shutdown to reach Mode 3 within the following 6 hours.

C. Verify that all Train B emergency equipment is operable within 2 hours or initiate a plant shutdown to reach Mode 3 within the following 12 hours.

D. Place 3A 4kv bus and 3A/3C 480V load center bus stripping logic in the tripped condition within 2 hours.

Q #79

ANSWER: B
KA: 000057G2.1.33
As it relates to Loss of Vital AC Inst. Bus: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.
(3.4 / 4.0)
10CFR55: 43.b.2

Reference: 3-ONOP-003.7 Encl. 1, NOTE 1. Tech Specs. 3.0.3 - Page 3/4 0-1

Cog Level: 2 Comprehension
Level 2 because the operator must analyze indications, determine that they are caused by a loss of 3P07 and relate that the most limiting impact results in a loss of the bus stripping relays. He must then relate that the loss of bus stripping results in a loss of an auto start signal to the AFW actuation as well as the EDG output breaker auto closure failure. He then must determine that the TS actions of 3.0.3 are required based on AFW availability.

New Question

Response Analysis:

A. Incorrect, indications are for a loss of 3P07 therefore operators must take action within 1 hour to restore the Vital AC panel or initiate a plant shutdown to reach Mode 3 within the following 6 hours because AFW actuation logic has been degraded. Plausible because 3A EDG auto-start capability has been degraded and 3A EDG tech specs are also applicable (but less restrictive).

B. Correct per the reference. Operators should restore 3P07 to service within 1 hour or initiate a plant shutdown to reach Mode 3 within the following 6 hours because AFW actuation logic has been degraded.

C. Incorrect, indications are for a loss of 3P07 therefore operators must take action within 1 hour to restore the Vital AC panel or initiate a plant shutdown to reach Mode 3 within the following 6 hours because AFW actuation logic has been degraded. Plausible because all Train B emergency equipment needs to be verified operable within 2 hours.

D. Incorrect, indications are for a loss of 3P07 therefore operators must take action within 1 hour to restore the Vital AC panel or initiate a plant shutdown to reach Mode 3 within the following 6 hours because AFW actuation logic has been degraded. Plausible because operators will need to place 3A 4kv bus and 3A/3C 480V load center bus stripping logic in the tripped condition.

Q #80

Unit 4 is at 100% power with all systems in normal alignment when the 4A ICW pump breaker trips open on over-current.

The 4A ICW pump is declared inoperable and removed from service.

Which ONE of the following describes the Technical Specification limits associated with the 4A ICW pump being out of service?

Unit 4 is in a:

A. 72 hour action statement. The action statement time can be extended to seven days if 4D 4KV Bus is realigned to 4A 4KV Bus.

B. 72 hour action statement. The action statement time can NOT be extended by realigning 4D 4KV Bus.

C. seven day action statement. The action statement time can be extended to thirty days if 4D 4KV Bus is realigned to 4A 4KV Bus.

D. seven day action statement. The action statement time can NOT be extended by realigning 4D 4KV Bus.

Q #80

ANSWER: A

KA: 000062G2.2.22
As it relates to Loss of Nuclear Svc Water: Knowledge of limiting conditions for operations & safety limits. 3.4/4.1

10CFR55: 43.b.2

Reference: Tech Spec 3.7.3 Actions a and b
5610-T-E-1591, Sheet 1

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that the 4A ICW pump is powered from 4A 4KV Bus. If plant components are in normal alignment, 4B and 4C ICW pumps share the same train power supply resulting in a 72 hour action statement. Swapping 4D Bus to 4 A Bus places 4C ICW pump on the "A" Train increasing the Action Time to 7 days.

New Question

Response Analysis:

A. Correct per the reference. Unit 4 is in a 72 hour action statement. The action statement time can be extended to seven days if 4D 4KV Bus is realigned to 4A 4KV Bus.

B. Incorrect because the action statement time can be extended to seven days if 4D 4KV Bus is realigned to 4A 4KV Bus. Plausible because Unit 4 is in a 72 hour action statement.

C. Incorrect because Unit 4 is in a 72 hour action statement. Plausible because 7 days is the correct action statement time for a CCW pump and the action statement time can be extended to 30 days (for a CCW pump) if 4D 4KV Bus is realigned to 4A 4KV Bus.

D. Incorrect because Unit 4 is in a 72 hour action statement and the action statement time can be extended if 4D 4KV Bus is realigned to 4A 4KV Bus. Plausible because 7 days is the correct action statement time for a CCW pump.

Q #81

Unit 3 is at 100% power when a loss of all feedwater event occurs.

As the crew transitions from 3-EOP-E-0, the STA informs them a red path exists on Heat Sink.

The operators successfully initiate bleed and feed.

Which ONE of the following describes the reportability of this event?

The event must be reported to the:

A. NRCOC within 4 hours.

B. NRC Resident within 4 hours.

C. State of Florida within 15 minutes and to the NRC immediately following State notification.

D. State of Florida within 1 hour and to the NRC immediately following State notification.

REFERENCE PROVIDED

Q #81

ANSWER: C

KA: W/E05G2.4.30
As it relates to Loss of secondary Heat Sink: Knowledge of which events related to system operations/status should be reported to outside agencies. 2.2/3.6

10CFR55: 43.b.5

Reference: 0-EPIP-20101, Enclosure 1, Category 5, Item C.3
0-EPIP-20101, CAUTIONS before Step 5.6.1.11
ADM-115, Enclosures 1 & 2

Cog Level: 1 Recall

New Question

Provide EPIP-20101 Enclosure 1 and ADM-115, Enclosures 1 & 2 as a reference

Response Analysis:

A. Incorrect because the event must be reported to the State of Florida within 15 minutes and to the NRC immediately following State notification in accordance with 0-EPIP-20101, "Duties of the Emergency Coordinator." Plausible because notification to the NRCOC IAW ADM-115 is required in the event of the occurrence of significant events as defined in 10CFR50.72.

B. Incorrect because the event must be reported to the State of Florida within 15 minutes and to the NRC immediately following State notification in accordance with 0-EPIP-20101, "Duties of the Emergency Coordinator." Plausible because notification to the NRC Resident IAW ADM-115 is required in the event of the occurrence of significant events.

C. Correct per the reference. The event must be reported to the State of Florida within 15 minutes and to the NRC immediately following State notification

D. Incorrect because the event must be reported to the State of Florida within 15 minutes and to the NRC immediately following State notification in accordance with 0-EPIP-20101, "Duties of the Emergency Coordinator." Plausible because the 1 hour time frame applies to NRC notification and certain other notifications described in 0-ADM-115.

Q #82

Unit 3 is at 50% power with control Bank "D" at 180 steps.
A momentary power loss in the 2BD Power Cabinet control power circuitry causes all 3 of the Bank "D" group 2 rods to drop 140 steps into the core where they are gripped and held normally by the re-energized stationary grippers.

Which ONE of the following describes the correct actions the Unit Supervisor should direct the operators to perform?

A. Verify rod control is in AUTOMATIC and reduce turbine load using 3-ONOP-100, "Fast Load Reduction", to lower Tref to within 3°F of Tavg.

B. Verify rod control is in MANUAL and reduce turbine load using 3-ONOP-100, "Fast Load Reduction", until all Bank "D" rods are aligned within 12 steps

C. Manually trip the reactor, verify the reactor is tripped, perform 3-EOP-E-0 and stabilize the plant using 3-EOP-ES-0.1.

D. Manually trip the reactor, verify the reactor is tripped and Emergency Borate per 3-ONOP-046.1.

Q #82

ANSWER: C

KA: 000003G.2.4.6
As it relates to the dropped control rod event: Knowledge of symptom based EOP mitigation strategies. 3.1/4.0

10CFR55: 43.b.5

Reference: 3- ONOP-028.3, Step 1
3-EOP-E-0, Step 1,
3-EOP-ES-0.1, Step 5

Cog Level: 2 Comprehension
The SRO must recognize that even though the dropped rods did not fully insert a reactor trip is required. He then must analyze that the control rods that were dropped initially would still be trippable as they were re-gripped by the stationary grippers and should be free to fall on the trip. He then must understand that the EOP network only addresses rods that do not fully insert on a trip by emergency borating using ONOP-46.1, dropped rods are not addressed unless they fail to insert.

New Question

Response Analysis:

A. Incorrect because the reactor would be manually tripped. Plausible because Tavg is restored to Tref by borating and reducing turbine load in ONOP-28.3 which is used for dropped rod recovery. ONOP-028.3 requires the Rod Control Selector Switch to be placed in MANUAL.

B. Incorrect because the reactor would be manually tripped. Plausible because Tavg is restored to Tref by borating and reducing turbine load in ONOP-28.3 which is used for dropped rod recovery.

C. Correct as the event described was multiple dropped rods that were relatched by the normal operation of the stationary grippers, they should still be trippable and fully insert when the manual trip is ordered. The EOPs only address rods that are stuck out of the core.

D. Incorrect because the EOPs only address stuck rods and these rods should still insert on the reactor trip. Plausible because the step in ES-0.1 directs the operator to Emergency Borate using 3-ONOP-046.1 to compensate for any stuck rods.

Q #83

Operators are increasing Unit 3 power to 100%.

- With power at 95% power, annunciator B 9/3, SHUTDOWN ROD OFF TOP / DEVIATION, alarms.
- The RO reports that control rod H-8 (D Bank) has stopped moving and is now 14 steps lower than other D Bank control rods.
- Subsequent investigation reveals H-8 is stuck and untrippable.

Which ONE of the following describes the Tech Spec required operator response and the BASIS for the action?

A. Place Unit 3 in Mode 3 within 6 hours to ensure adequate Shutdown Margin requirements are met.

B. Place Unit 3 in Mode 3 within 6 hours to reduce the effect of the stuck rod on the subsequent Xenon Oscillation.

C. Declare H-8 inoperable and reduce power to < 75% within 1 hour, confirm all Bank "D" rod positions are within ± 12 steps of each other to ensure adequate Shutdown Margin requirements are met.

D. Declare H-8 inoperable and reduce power to < 75% within 1 hour, confirm all Bank "D" rod positions are within ± 18 steps of each other to reduce the affect of the stuck rod on the subsequent Xenon Oscillation.

Q #83

ANSWER: A

KA: 000005G.2.2.22
As it relates to the Inoperable/Stuck Control Rod: knowledge of limiting conditions for operations and safety limits. 3.4/4.1

10CFR55: 43.b.2

Reference: 3-ONOP-028, Step 5.1.4.2
Tech Spec 3.1.3.1 Action a.
0-ADM-536, Section 3/4.1.3

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference.

B. Incorrect because Xenon Oscillations are not the basis for the requirement to be in MODE 3 in 6 hours. Plausible because the reactor must be placed in MODE 3 within 6 hours. Misaligned rods could be an initiating event for Xe oscillations which do challenge the power distribution limits.

C. Incorrect because the unit must be placed in Mode 3 within 6 hours. Plausible because the rod must be declared inoperable and reducing power to <75% would be a correct response if the rod was trippable. Reducing power using boration would increase shutdown margin.

D. Incorrect because the unit must be placed in Mode 3 within 6 hours and Xenon oscillations are not the basis. Plausible because reducing power to <75% and confirming all rods in the bank are within 18 steps would reduce peaking factors and would be a correct response if the rod were not untrippable.

Q #84

Unit 4 is at 80% power during end of life (EOL) power coast down operation.

- Tavg is being allowed to "droop" to maintain the reactor critical and is presently 3°F BELOW Tref as directed by Reactor Engineering.

The auto function of the running Charging pump controller fails causing the Charging pump to operate at minimum speed.

Which ONE of the following identifies the correct procedure the Unit Supervisor should enter to respond to this failure and the pressurizer level that the Unit Supervisor will direct the RO to maintain?

A. 4-ONOP-041.6, "Pressurizer Level Control Malfunction"
44%.

B. 4-ONOP-047.1, "Loss of Charging Flow in Modes 1 Through 4"
44%.

C. 4-ONOP-041.6, "Pressurizer Level Control Malfunction"
47%.

D. 4-ONOP-047.1, "Loss of Charging Flow in Modes 1 Through 4"
47%.

Q #84

ANSWER: A

KA: 000028AA2.08
Able to determine and interpret the following as they apply to Pressurizer Level Malfunction: PRZ level as a function of power level. 3.1/3.5

10CFR55: 43.b.5

Reference: 4-ONOP-041.6, Step 4.2 & Enclosure 1,
SD-009 pages 8 & 9

Cog Level: 3 Application / Analysis
Level 3 because the SRO must recognize that the automatic pressurizer level control system would have been maintaining level lower based on the lower than normal Tavg for the present power level. He must calculate the programmed pressurizer level for the given plant conditions and relate that Tavg is being maintained at 3°F below Tref and that Prz level reference signal is generated from Tavg and not from power. Tref at 80% power would normally be 568.6°F which would demand 47% pressurizer level but since Tavg is 3°F low, the required pressurizer level would be 44%. Calculation: 22% to 53% level. 80% X 31% program level span = 25%. 25% + 22% = 47% for 80% power but Tavg is not on program so the pressurizer level must be maintained at 44% to equate to the 565.6°F Tavg.

New Question

Response Analysis:

A. Correct because the correct procedure the Unit Supervisor should enter to respond to this failure is 4-ONOP-041.6, and the pressurizer level that the Unit Supervisor will direct the RO to maintain is 44%.

B. Incorrect because the Unit Supervisor should enter 4-ONOP-041.6. Plausible because 44% is the correct value for pressurizer level.

C. Incorrect because the correct value for pressurizer level is 44%. Plausible because the Unit Supervisor should enter 4-ONOP-041.6.

D. Incorrect because the Unit Supervisor should enter 4-ONOP-041.6, and the pressurizer level that the Unit Supervisor will direct the RO to maintain is 44%. Plausible because 47% is the normal programmed level for this power level and one charging pump at minimum speed approximates the entry conditions for ONOP-047.1.

Q #85

With reactor power at 80%, PRMS-R-15 alarms and count-rate increases rapidly and stabilizes at 5,000 cpm.

Operators enter 3-ONOP-071.2, "Steam Generator Tube Leakage," and attempt to quantify the leakage using the R-15 Primary to Secondary Leak Rate Graph in the Plant Curve Book.

Unit 3 Condenser air in-leakage is constant at 7 scfm.

All of the S/G tube leakage is coming from the 3B S/G.

Which ONE of the following is correct regarding the Tech Spec limits and the directions the SRO should give based on the above plant conditions?

The RCS primary to secondary leakage has:

A. NOT exceeded the Tech. Spec. limit. Be in Mode 3 in ≤ 2 hours.

B. NOT exceeded the Tech. Spec. limit. Be in Mode 3 in ≤ 24 hours.

C. exceeded the Tech. Spec. limit. Be in Mode 3 in ≤ 1 hour.

D. exceeded the Tech. Spec. limit. Be in Mode 3 in ≤ 6 hours.

REFERENCE PROVIDED

Q #85
ANSWER: C

KA: 000037G2.1.33 As it relates to Steam Generator Tube Leak: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. 3.4/4.0

10CFR55: 43.b.2
Reference: 3-ONOP-071.2, Step 7, 9a
TS 3.4.6.2.c
PCB Section 5, Figure 15, Unit 3 R-15 Primary to Secondary Leak

Cog Level: 3 Application / Analysis

Level 3 because the operator must locate the correct point on the R-15 curve, read the value from the curve (which is less than the TS limit) and then relate the air in-leakage to the need to multiply the value by 7. Then the operator must compare the multiplied value to the TS limit of 500 gpd and determine the TS limit has been exceeded. The operator must then recall the guidance of ONOP-071.2 to be in Mode 3 within 1 hour.

New Question
Examiner note: ONOP 71.2 and TS have been frozen earlier revision. 5000 cpm = 122 gpd from graph. Multiply 122 X 7 scfm = 854 gpd which exceeds TS limit of 500 gpd from one S/G.

Provide PCB Section 5, Figure 15 as a reference

Response Analysis:

A. Incorrect because S/G tube leakage has exceeded the Tech. Spec. limit and the unit must be in Mode 3 in ≤ 1 hour. Plausible because if the curve is read directly without multiplying by 7, the S/G tube leakage will not have exceeded the Tech. Spec. limit and a Mode 3 shutdown is required.

B. Incorrect because S/G tube leakage has exceeded the Tech. Spec. limit and the unit must be in Mode 3 in ≤ 1 hour. Plausible because if the curve is read directly without multiplying by 7, the S/G tube leakage will not have exceeded the Tech. Spec. limit and a Mode 3 shutdown is required.

C. Correct per the reference. The RCS primary to secondary leakage has exceeded the Tech. Spec. limit and the unit must be placed in Mode 3 in ≤ 1 hour per 3-ONOP-071.2.

D. Incorrect because the unit must be in Mode 3 in ≤ 1 hour. Plausible because S/G tube leakage has exceeded the Tech. Spec. limit.

Q #86

Unit 3 is in Mode 3 with the reactor trip breakers open.

- A cooldown to Mode 4 has been initiated.
- 3A RCP breaker is racked out for corrective maintenance.
- 3B RCP is in operation.
- 3C RCP is operable but stopped.

A Normal Containment Cooler (NCC) fails, resulting in the 3B RCP stator temperature increasing to 250°F.

Which ONE of the following describes the directions the SRO should give to the operators regarding RCP operation based on 3B RCP stator temperature reaching 250°F?

A. Stop 3B RCP in accordance with 3-ONOP-041.1, "Reactor Coolant Pump Off-Normal" and close the associated pressurizer spray valve. Suspend all operations involving RCS dilution.

B. Stop 3B RCP in accordance with 3-ONOP-041.1, "Reactor Coolant Pump Off-Normal". Immediately start the 3C RCP in accordance with 3-OP-041.1, "Reactor Coolant Pump."

C. Contact the Electrical Maintenance Supervisor to authorize continued 3B RCP operations. Make preparations to start 3C RCP in accordance with 3-OP-041.1, "Reactor Coolant Pump."

D. Contact the System Engineer and Operations Supervision to authorize continued 3B RCP operations. Verify 3B 4KV Bus voltage is between 3740 and 4580 volts

Q #86

ANSWER: A

KA: 003A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the RCP; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Problems associated with RCP motors, including faulty motors and current, and winding and bearing temperature problems. 2.7/3.1

10CFR55: 43.b.5
Reference: 3-ONOP-041.1, Step 44, FO page - Step 1 & 5
SD-29, Page 10 and Fig. 1

Cog Level: 2 comprehension - Level 2 because the SRO must recognize that NCCs provide cooling to the RCP motor compartments thereby cooling the stator and not the pump bearings. He then must understand that two NCCs cannot maintain the containment ambient temperature constant at full power, and that an increase in containment temperature will cause an increase in the stator temperatures of the RCPs, he then must recall the threshold temperature to take action and the correct action to take,

New Question

Response Analysis:

A. Correct per the reference.

B. Incorrect because If stator temperatures exceed 248°F, operators should stop all RCPs. They would not start the available RCP with out NCCs operating. Plausible because RCP stator temperatures will start to rise and 248°F is the temperature requiring operators to take action.

C. Incorrect because the Electrical Supervisor may only authorize operation in excess of limits for stator temperature <u>if the authorization is given before starting the RCP</u>. If stator temperatures exceed 248°F, operators should stop all RCPs. They would not start the available RCP with out NCC operating.

D. Incorrect because the Electrical Supervisor may only authorize operation in excess of limits for stator temperature <u>if the authorization is given before starting the RCP</u>. If stator temperatures exceed 248°F, operators should stop all RCPs. They would not start the available RCP with out NCC operating.

Q #87

Operators are performing 3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation," in response to a LOCA and failure of both RHR pumps.

As directed by 3-EOP-ECA-1.1, both Containment Spray pumps (CSPs) have been stopped.

The STA reports Containment pressure is 22 psig.

Which ONE of the following describes the correct procedural direction and the associated BASIS?

A. Continue performing ECA-1.1.
Maintain CSPs stopped in accordance with the guidance of ECA-1.1.
Maximizes availability of the RWST inventory for injection flow.

B. Continue performing ECA-1.1.
Start CSPs in accordance with the guidance of FR-Z.1.
Containment barrier protection is a higher priority than injection flow as long as RWST level is > 60,000 gallons.

C. Transition to FR-Z.1, "Response to High Containment Pressure."
Start CSPs in accordance with the guidance of FR-Z.1.
Containment barrier protection is a higher priority than injection flow as long as RWST level is > 60,000 gallons.

D. Transition to FR-Z.1, "Response to High Containment Pressure."
Maintain CSPs stopped in accordance with the guidance of ECA-1.1.
Maximizes availability of the RWST inventory for injection flow.

Q #87

ANSWER: D

KA: 006G2.4.6
As it relates to Emergency Core Cooling: Knowledge of symptom based EOP mitigation strategies. 3.1/4.0

10CFR55: 43.b.5

Reference: 3-EOP-ECA-1.1, Step 8
3-EOP-FR-Z.1, CAUTION Prior to Step 8

Cog Level: 3 Analysis
Level 3 because the situation will require the SRO to analyze competing priorities for the remaining RWST injection water and determine that even though a higher priority procedure (FR-Z-1) would start the CSPs the EOP mitigating strategy to follow is to conserve the RWST inventory to protect the core. The SRO must understand that a transition to FR-Z.1 is required but that a caution in FR-Z.1 states that the CSPs should be operated iaw the requirements of ECA-1.1. The SRO must relate the plant conditions and determine that maintaining the reduced injection flow established in ECA-1.1 is more of a priority than running the CSPs under these conditions even though an Orange path on the containment exists.

New Question

Response Analysis:

A. Incorrect because the Orange path on containment integrity must be addressed but the EOP mitigating strategy will not run a CSPs if recirculation is not available in order to maintain injection flow for as long as possible.

B. Incorrect because the Orange path on containment integrity must be addressed but the CSPs will not be run if recirculation is not available in order to maintain injection flow for as long as possible.

C. Incorrect because the Orange path on containment integrity must be addressed but the CSPs will not be run if recirculation is not available in order to maintain injection flow for as long as possible. Plausible because transition will be made to FR-Z.1 which will direct that the CSPs to be started unless the RWST is needed for injection flow.

D. Correct per the reference

Q #88

Operators are responding to a reduced Intake Cooling Water (ICW) flow due to Intake Cooling Water System leakage.

Which ONE of the following describes the effect (if any) on the Normal Containment Coolers (NCCs) ability to remove heat from the Containment, the consequences of that effect, and the correct operator response?

The NCCs ability to remove heat is:

A. degraded. Containment temperatures will INCREASE toward the TS limit of 125°F and equipment environmental qualifications WILL be challenged. Initiate Containment Purge in accordance with 0-OP-053, "Containment Purge System."

B. degraded. Containment temperatures will INCREASE toward the TS limit of 125°F and equipment environmental qualifications WILL be challenged. Isolate the affected portion of the ICW system and establish at least one operable ICW header.

C. unaffected. Containment temperatures will NOT CHANGE and equipment environmental qualifications will NOT be challenged. Initiate Containment Purge in accordance with 0-OP-053, "Containment Purge System."

D. unaffected. Containment temperatures will NOT CHANGE and equipment environmental qualifications will NOT be challenged. Isolate the affected portion of the ICW system and establish at least one operable ICW header.

Q #88

ANSWER: B

KA: 022A2.04
Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of service water. 2.9/3.2

10CFR55: 43.b.5

Reference: 3-ONOP-019, Step 5 RNO, SD-029, Page 8, SD-040, Page 7
Tech Specs 3.6.1.5 & Basis

Cog Level: 2 comprehension
Level 2 because the operator must recognize that the ICW system provides heat removal for the CCW system which provides heat removal for containment via the Normal Containment coolers and the Control Rod Drive Mechanism coolers. The actions of several ONOPs will reduce heat loads on the system but ultimately the CCW temperatures will rise causing the containment temperature to rise.

New Question

Response Analysis:

A. Incorrect because there is no procedural direction to initiate a Containment Purge. Plausible because the NCCs ability to remove heat is degraded and Containment temperatures will increase toward the TS limit of 125°F and equipment environmental qualifications will be challenged and because initiating a containment purge would reduce containment temperatures.

B. Correct per the reference

C. Incorrect because the NCCs ability to remove heat is degraded. Containment temperatures will increase and equipment environmental qualifications will be challenged and because there is no procedural direction to initiate a Containment Purge. Plausible because initiating a containment purge would reduce containment temperatures

D. Incorrect because the NCCs ability to remove heat is degraded. Containment temperatures will increase and equipment environmental qualifications will be challenged. Plausible because operators will Isolate the affected portion of the ICW system and establish at least one operable ICW header.

Q #89

Both units are at 100% power with all systems in normal alignment.

- 0-OSP-075.11, "Auxiliary Feedwater Inservice Test," is being performed to test the "A" AFW pump.
- The Shift Manager is notified that the "A" AFW pump developed 300 gpm at a maximum obtainable speed of 5900 RPM.

Which ONE of the following describes the correct Shift Manager response?

Declare the "A" AFW pump:

A. operable and return it to service.
Verify "A" AFW pump is aligned to Train 1 to ensure compliance with the TS LCO.

B. available and return it to service
Verify "A" AFW pump is aligned to Train 1 to ensure compliance with the TS LCO.

C. inoperable and remove it from service.
Align "C" AFW pump to Train 1 to extend the AFW TS action time from 72 hours to 30 days.

D. inoperable and remove it from service.
Align "B" AFW pump to Train 2 to extend the AFW TS action time from 72 hours to 30 days.

Q #89

ANSWER: C

KA: 061G2.2.22
As it relates to the AFW system: knowledge of limiting conditions for operations and safety limits. 3.4/4.1

10CFR55: 43.b.2

Reference: 3-OP-075, Section 7.1
0-OSP-075.11, Step 7.1.6.1
TS 3.7.1.2 Actions 1 and 3

Cog: Level: 2 comprehension
Level 2 because the operator must recognize that 5800 RPM and 300 gpm do not meet the criteria for a SAT test. and the pump must be declared inoperable. Then the operator must recognize that even though either "B" or "C" AFW pump can be aligned to Train 1, OP-075 directs that "C" AFW pump be aligned to Train 1 and finally it is this action that will restore 2 independent AFW trains and increase the Action Time to 30 days.

New Question

Response Analysis:

A. Incorrect because the "A" AFW pump failed to develop enough flow and must be declared inoperable and taken OOS. Plausible because the "A" AFW pump was OOS during the Inservice Test and would normally be returned to service to Train 1 if the test had been SAT.

B. Incorrect because the "A" AFW pump failed to develop enough flow and must be declared inoperable and taken OOS. Plausible because the "A" AFW pump must be restored to service but it will be to train 1 not Train 2.

C. Correct per the reference. Operators will declare the "A" AFW pump inoperable and remove it from service and then align "C" AFW pump to Train 1 to extend the AFW TS action time from 72 hours to 30 days.

D. Incorrect because operators need to align "C" AFW pump to Train 1 to extend the AFW TS action time from 72 hours to 30 days. "B" AFW pump is already aligned to Train 2 but until "C" pump is aligned to Train 1, the TS Action Time is still 72 hours. Plausible because "B" AFW pump is normally aligned to Train 2..

Q #90

Unit 4 is in Mode 1 with all systems operable, when the sample inlet temperature to Containment particulate and gas monitors, PRMS-11/12, increases to 125°F.

Which ONE of the following describes the Tech Spec implications (if any) of this event?

The elevated inlet temperature:

A. did NOT affect operability of R-11 or R-12.
The applicable Tech Spec LCO is satisfied.

B. disabled R-11 only.
Verify R-12 is operable and the associated Tech Spec LCO will be satisfied.

C. disabled R-12 only.
Verify R-11 is operable and the associated Tech Spec LCO will be satisfied.

D. disabled both R-11 and R-12.
Until operability of R-11 or R-12 is restored, comply with the applicable Tech Spec Action Statement.

Q #90

ANSWER: D

KA: 073G2.1.33
As it relates to Process Radiation Monitoring: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. 3.4/4.0

10CFR55: 43.b.2

Reference: SD-068, Page 27 and Figure 20
TS 3.4.6.1

Cog Level: 2 comprehension
Level 2 because the operator must recognize that skid inlet temperature rising to 125°F triggers the high temperature alarm and closes the inlet and outlet valves and stops the sample pumps. Because the sample flows through both R-11 and R12 in series, both R-11 and R-12 have lost sample flow. The TS Action Statement applies if both R-11 and R-12 are inoperable. If either R-11 or R-12 are satisfied, the LCO is satisfied.

New Question

Response Analysis:

A. Incorrect because the high temperature disabled both R-11 and R-12. Plausible because if the high temperature had not disabled R-11 and R-12, the applicable Tech Spec LCO would be satisfied.

B. Incorrect because the high temperature disabled both R-11 and R-12. Plausible because if R-12 remained operable, the applicable Tech Spec LCO would be satisfied.

C. Incorrect because the high temperature disabled both R-11 and R-12. Plausible because if R-11 remained operable, the applicable Tech Spec LCO would be satisfied.

D. Correct per the reference. The elevated inlet temperature disabled both R-11 and R-12. Until operability of R-11 and R-12 is restored, comply with the applicable Tech Spec Action Statement.

Q #91

Unit 3 is at 100% power with all systems in normal alignment and control rods fully withdrawn.

- Annunciator F 4/6, RPIS POWER TROUBLE, alarms.
- The field operator reports that the 3D01 supply breaker to the RPI inverter has tripped open.

Predict the impact of this failure on the rod position indication (RPI) system and the actions required.

RPIs will be powered from the CVT:

A. automatically, and the RPI indication may have changed.
Initially implement 3-ONOP-028.1, "RCC Misalignment."
Then transition to 3-ONOP-028.2, "RCC Position Indication Malfunction."

B. after manual transfer, and the RPI indication may have changed.
Initially Implement 3-ONOP-028.2, "RCC Position Indication Malfunction."

C. automatically, and the RPI indication will NOT change.
Initially Implement 3-ONOP-028.2, "RCC Position Indication Malfunction."

D. after manual transfer, and the RPI indication will NOT change.
Initially implement 3-ONOP-028.1, "RCC Misalignment."
Then transition to 3-ONOP-028.2, "RCC Position Indication Malfunction."

Q #91

ANSWER: A

KA: 014A2.02
Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: loss of power to the RPIs. 3.1/3.6

10CFR55: 43.b.5

Reference: SD-006 Page 11 and Figure 5,
3-ONOP-028.1, Step 1.1, 5.6
3-ONOP-028.2, Step 1.1, 5.3
3-ARP-097.CR, F 4/6
3-ONOP-028.2 Basis – NOTE before Step 5.3 and Step 5.3

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference

B. Incorrect because the RPI power supply has auto-transferred from the inverter to the CVT. Plausible because the RPIs may indicate different than before the power interruption and operators will Initially implement 3-ONOP-028.1, "RCC Misalignment," then transition to 3-ONOP-028.2, "RCC Position Indication Malfunction."

C. Incorrect because ONOP-028.2 is not a direct entry procedure and station OE has demonstrated that the output voltage of the CVT is different than the inverter resulting in all RPIs indicating differently after transfer. Operators must first perform actions of ONOP-028.1 and then transition to ONOP-028.2 when directed. Plausible because The RPI power supply has auto-transferred from the inverter to the CVT.

D. Incorrect because the RPI power supply has auto-transferred from the inverter to the CVT and because OE has demonstrated that the output voltage of the CVT is different than the inverter resulting in all RPIs indicating differently after transfer

Q #92

The following event occurs:

- ARMS Channel 15, Aux Bldg North N/S Corridor, alarms.

Which ONE of the following describes the correct order of response directed by the SRO?

A. Evacuate persons in the affected area.
Silence the alarm.
Verify the alarm is valid at the ARMs control panel.
Notify HP to survey the area.

B. Verify the alarm is valid at the ARMs control panel.
If the alarm is valid then evacuate persons in the affected area.
Notify HP to survey the area.
Silence the alarm.

C. Silence the alarm.
Verify the alarm is valid at the ARMs control panel.
If the alarm is valid then evacuate persons in the affected area.
Notify HP to survey the area.

D. Notify HP to survey the area.
Silence the alarm.
Verify the alarm is valid at the ARMs control panel.
If the alarm is valid then evacuate persons in the affected area.

Q #92

ANSWER: B

KA: 072G2.1.14
As it relates to Area Radiation Monitoring: Knowledge of system status criteria which require the notification of plant personnel. 2.5/3.3

10CFR55: 43.b.4, 43.b.5

Reference: 0-ONOP-066, Steps 2, 3, 5, and 7

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the alarm should be verified valid before evacuating persons from the area and we don't silence the alarm until after HP has surveyed the area. Plausible because we do verify the alarm is valid and evacuate persons before HP is dispatched to survey and before the alarm is silenced.

B. Correct per the references. The SRO will direct the RO to verify the alarm is valid at the ARMs control panel. If the alarm is valid then operators will evacuate persons in the affected area and then notify HP to survey the area and finally silence the alarm.

C. Incorrect because the alarm is valid. Plausible because the alarm may be silenced if the alarm is determined to not be valid and because Radiation Protection will subsequently be called to survey the area.

D. Incorrect because the alarm is valid. Plausible because the alarm may be silenced if the alarm is determined to not be valid and because Radiation Protection will subsequently be called to install a portable radiation monitor.

Q #93

Operators are responding to a large break LOCA when the STA reports the following QSPDS Core Exit Thermocouple readings:

Quad 1		Quad 2		Quad 3		Quad 4	
CET	Temp	CET	Temp	CET	Temp	CET	Temp
R7	660	K5	1250	H8	415	K11	666
P8	590	K3	???	F9	835	N15	680
N6	604	J2	2300	E8	???	H13	602
N4	625	G6	675	B10	905	H9	615
M11	???	G1	1560	B5	660	E14	622
M9	???	F5	2300			E12	688
L8	670	F3	1780				

Which ONE of the following describes the core condition and the direction the SRO will give to the crew?

CETs J2 and F5:

A. should be included in the core condition evaluation.
A Red Path exists.
Transition to 3-EOP-FR-C.1, "Response to Inadequate Core Cooling."

B. should be included in the core condition evaluation.
An Orange Path exists.
Transition to 3-EOP-FR-C.2, "Response to Degraded Core Cooling."

C. should NOT be included in the core condition evaluation.
A Red Path exists.
Transition to 3-EOP-FR-C.1, "Response to Inadequate Core Cooling."

D. should NOT be included in the core condition evaluation.
An Orange Path exists.
Transition to 3-EOP-FR-C.2, "Response to Degraded Core Cooling."

Q #93

ANSWER: A

KA: 017A2.02
Ability to (a) predict the impacts of the following malfunctions or operations on the ITM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Core Damage 3.6/4.1

10CFR55: 43.b.5

Reference: 3-EOP-F-0, Enclosure 2 and Basis Page 20

Cog Level: 3 Analysis
Level 3 because the operator must analyze all of the core temperature data and then recall that the evaluation is based on the five highest CETs including the failed CETS and that threshold for Red Path is 1200°F (Orange Path = 700°F). Review of the QSPDS readings reveals that including the failed CETs reveals a Red Path Condition and FR-C.1 needs to be implemented. This must be determined even though that if the failed CETs are not included, five CETs are greater than 700°F and the operator will conclude erroneously that only an Orange Path exists.

New Question

Response Analysis:

A. Correct per the references

B. Incorrect because a Red Path exists and transition should be made to 3-EOP-FR-C.1, "Response to Inadequate Core Cooling." Plausible because the conditions for an Orange Path also exist and EOP-FR-C.2 is the correct procedure to transition for an Orange Path.

C. Incorrect because the failed CETs should be included in the evaluation. Plausible because a Red Path exists and operators should transition to 3-EOP-FR-C.1, "Response to Inadequate Core Cooling."

D. Incorrect because the failed CETs should be included in the evaluation. Plausible because the conditions for an Orange Path also exist and EOP-FR-C.2 is the correct procedure to transition for an Orange Path.

Q #94

With Unit 3 at 80% power, operators are responding to a Xenon oscillation. The RO reports the following values of Axial Flux Difference (AFD):

- N-41: + 13
- N-42: + 12
- N-43: + 16
- N-44: + 17

Which ONE of the following describes the condition of the reactor's AFD and the direction the SRO should give the RO regarding these conditions?

The reactor AFD is:

A. within the operational space.
Operation at this power level may continue indefinitely.

B. within the operational space.
Use dilution and manual rod control to restore AFD to within the operational space on all power range channels within 15 minutes.

C. outside the operational space.
Use dilution and manual rod control to restore AFD to within the operational space on at least 3 power range channels within 15 minutes.

D. outside the operational space.
Use boration and manual rod control to restore AFD to within the operational space on at least 3 power range channels within 15 minutes.

REFERENCE PROVIDED

Q #94

ANSWER: C

KA: G2.1.7
Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation. 4.4
10CFR55: 43.b.5

Reference: PCB Section 5, Figure 1A & Section 7, Figure 1
0-ADM-536, Attachment 1, Section 3/4.2
3-ARP-097.CR, G 5/1
3-ONOP-059.4, Step 2

Cog Level: 2 comprehension
Level 2 because the operator will have to plot the given AFD values on the reference provided. Then the operator will have to recognize that 2 values are outside the operational space. 2 of the 4 values outside implies that AFD is out of the operational space. The operator will then have to recall that dilution and rod control are the prescribed methods to return to the operational space when out on the high side.

New Question

Provide PCB Section 5, Figure 1 & 1A as references

Response Analysis:

A. Incorrect because the AFD is outside the operational space. Plausible because 2 of the four AFD values are within the operational space and if AFD was within the operational space, operation at this power level may continue indefinitely.

B. Incorrect because the AFD is outside the operational space. Plausible because dilution and rod control would be the prescribed method to restore all channels within the operational space if out on the high side.

C. Correct per the references. The reactor AFD is outside the operational space. Operators will use dilution and manual rod control to restore AFD to within the operational space on at least 3 power range channels within 15 minutes.

D. Incorrect because dilution and rod control is the prescribed method to restore AFD within the operational space when out on the high side. Plausible because the AFD is outside the operational space.

Q #95

The following plant conditions exist:

- Unit 3 RCS temperature is 400°F.
- Unit 4 RCS temperature is 310°F.

For the above conditions, which ONE of the following identifies the minimum required water inventory in the Condensate Storage Tank system and describes the basis for that required inventory?

A. 210,000 gallons.
Ensures sufficient water to maintain Unit 3 at Hot Standby condition for a minimum of 23 hours.

B. 210,000 gallons.
Ensures sufficient water to maintain Unit 4 at Hot Standby condition for a minimum of 23 hours.

C. 420,000 gallons.
This is sufficient water to maintain both Units at these conditions for a minimum of 15 hours and then cool down both reactor coolant systems to Mode 4.

D. 420,000 gallons.
This is sufficient water to maintain both units at these conditions for a minimum of 23 hours.

Q #95

ANSWER: A

KA; G2.1.32
Ability to explain and apply all system limits and precautions. 3.8

10CFR55: 43.b.2

Reference: 3-OP-018.1, Step 4.2
Tech Specs Table 1.2 and 3.7.1.3
0-ADM-536, Section 3/4.7.1.3

Cog Level: 2 Comprehension
Level 2 because the operator must evaluate the RCS temperatures provided and determine that Unit 3 is in Mode 3 and Unit 4 is in Mode 4. Only after this determination is made can the operator apply the correct Tech. Specs.

New Question

Response Analysis:

A. Correct per the reference

B. Incorrect because there is sufficient water to maintain only Unit 3 at these conditions for a minimum of 15 hours. Unit 4 would be on RHR at this temperature and its AFW system valved out. Plausible because 210,000 gallons is the required amount of water inventory in the CSTs.

C. Incorrect because only 210,000 gallons is the required amount of water inventory in the CSTs and Unit 3 is the only unit that would need CST water because Unit 4 would be on RHR at this temperature and its AFW system valved out. Plausible because the numbers shown are the numbers provided by the Tech Spec Basis document.

D. Incorrect because only 210,000 gallons is the required amount of water inventory in the CSTs and Unit 3 is the only unit that would need CST water because Unit 4 would be on RHR at this temperature and its AFW system valved out. Plausible because the numbers shown are the numbers provided by the Tech Spec Basis document.

Q #96

Both Units are at 100% power.

The 3A EDG is out of service and a 14 day Tech Spec Action Statement is in effect for Unit 3.

ECO requests have been submitted by Maintenance to remove the following equipment from service:

- 3A Containment Spray Pump
- 3A Emergency Containment Filter
- 3A Residual Heat Removal Pump
- Pressurizer Heater Control Group

If taken out of service, which ONE of the following components from the list above would reduce the Unit 3 effective Tech Spec Action Time from the current 14 days to 2 hours?

A. 3A Containment Spray Pump

B. 3A Emergency Containment Filter

C. 3A Residual Heat Removal Pump

D. Pressurizer Heater Control Group

Q #96

ANSWER: B

KA: G2.2.24
Ability to analyze the effect of maintenance activities on LCO status. 3.8

10CFR55: 43.b.2

Reference: TS 3.8.1.1, Action d.1
0-OSP-023.3, Step 6.1.2 and Attachment 2 Step 8

Cog Level: 2 comprehension
Level 2 because the operator must recognize that the 3A ECF is a Train B safety component and then determine the impact of that piece of equipment being out of service during the maintenance activity. The SRO must analyze that this reduced the Action time to 2 hours if the operators placed a Train B safety component OOS while the 3A EDG is OOS.

New Question

Response Analysis:

A. Incorrect because 3A Containment Spray Pump is Train A equipment and being out of service will not shorten the TS Action time from the 14 days associated with the EDG to 2 hours. Plausible because taking the 3A CSP OOS will introduce an additional TS Action time to comply with but it will be 72 hours, not 2 hours.

B. Correct per the reference

C. Incorrect because 3A Residual Heat Removal Pump is Train A equipment and being out of service will not shorten the TS Action time from the 14 days associated with the EDG to 2 hours. Plausible because taking the 3A RHRP OOS will introduce an additional TS Action time to comply with but it will be 7 days, not 2 hours.

D. Incorrect because the pressurizer control group heaters are Train A equipment and being out of service will not shorten the TS Action time from the 14 days associated with the EDG to 2 hours. Plausible because while the control group heaters do not have a Tech Spec LCO, the BU Group "A" heaters which are also Train "A" equipment do and taking the BU Group "A" heaters OOS will introduce an additional TS Action time to comply with but it will be 72 hours, not 2 hours.

Q #97

Which ONE of the following activities REQUIRES direct supervision by a licensed Senior Reactor Operator?

A. Underwater TV camera surveillance in the refueling cavity

B. Reactor vessel irradiation specimen removal

C. Lower internals removal

D. Control rod unlatching

Q #97

ANSWER: D

KA: G2.2.27
Knowledge of the refueling process. 3.5

10CFR55: 43.b.6/b.7

Reference: 4-OP-038.1, Step 4.1 & Section 4.6

Cog Level: 1 recall

Bank Question

Response Analysis:

A. Incorrect because underwater TV camera surveillance in the refueling cavity is not considered a Core Alteration and as such does not require direct supervision by an SRO. Plausible because this activity typically occurs directly over the core while the upper internals are removed and irradiated fuel in place.

B. Incorrect because reactor vessel irradiation specimen removal is not considered a Core Alteration and as such does not require direct supervision by an SRO. Plausible because this activity occurs directly over the reactor while the reactor head is removed.

C. Incorrect because lower internals removal is not considered a Core Alteration and as such does not require direct supervision by an SRO. Plausible because this activity occurs directly over the reactor while the reactor head and upper internals are removed.

D. Correct per the reference

Q #98

Core off-load is in progress on Unit 3.

- One fuel assembly is latched on the manipulator crane.
- Another fuel assembly is vertical in the upender on the Spent Fuel Pit side.

A refueling cavity seal failure occurs and cavity level begins decreasing rapidly.

Which ONE of the following describes the correct directions the SRO should give to the refueling operators?

A. Insert the assembly on the manipulator into the core and leave it latched.
Lay the assembly in the upender down and leave it in the transfer cart.

B. Insert the assembly on the manipulator into the core and unlatch it.
Relatch the assembly in the upender and move it to a fuel rack.

C. Do NOT Insert the assembly on the manipulator into the core but move it to the edge of the core and leave it suspended.
Lay the assembly in the upender down and leave it in the transfer cart.

D. Do NOT Insert the assembly on the manipulator into the core but move it to transfer canal.
Relatch the assembly in the upender and move it to a fuel rack.

Q #98

ANSWER: A

KA: G2.3.10
Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. 3.3

10CFR55: 43.b.4/b.7

Reference: 3-ONOP-033.2, Step 5.1.2, 5.1.3 & NOTE Prior to Step 5.2.4

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference.

B. Incorrect because the operator should lay the assembly in the upender down and leave it in the transfer cart. Plausible because operators should insert the assembly on the manipulator into the core but should leave it latched.

C. Incorrect because operators should insert the assembly on the manipulator into the core and leave it latched. Plausible because the operator should lay the assembly in the upender down and leave it in the transfer cart.

D. Incorrect because operators should insert the assembly on the manipulator into the core and leave it latched and because the operator should lay the assembly in the upender down and leave it in the transfer cart. Plausible because unlatch the assembly held by the manipulator and relatching the assembly in the upender and move it to a fuel rack are both workable options open to the operators but neither is directed by ONOP-033.2.

Q #99

Unit 3 has experienced a loss of offsite power (LOOP).

- The 3B EDG has energized the 3B 4KV bus as designed.
- 3A EDG locked out and can NOT be restarted.
- SI was NOT required and did NOT occur.
- Pressurizer level is stable.
- Reactor head and plenum RVLMS indicates full.

The SM has determined the Unit must be placed in MODE 5.

Which ONE of the following describes the mitigation strategies that should be implemented by the SRO per the EOP network for the present plant conditions?

A. Transition to 3-EOP-ES-0.2, "Natural Circulation Cooldown".
Limit cooldown rate to 25°F/hr and maintain RCS subcooling ≥ 80°F to avoid the possibility of thermal shocking the reactor vessel.

B. Transition to 3-EOP-ES-0.2, "Natural Circulation Cooldown".
Limit cooldown rate to 25°F/hr and maintain RCS subcooling ≥ 226°F to avoid the possibility of reactor vessel head void formation.

C. Transition to 3-EOP-ES-0.3, "Natural Circulation Cooldown with Steam Void in Vessel (with RVLMS)".
Limit cooldown rate to 100°F/hr and maintain RCS subcooling ≥ 80°F to avoid the possibility of thermal shocking the reactor vessel.

D. Transition to 3-EOP-ES-0.3, "Natural Circulation Cooldown with Steam Void in Vessel (with RVLMS)".
Limit cooldown rate to 100°F/hr and maintain RCS subcooling ≥ 226°F to limit reactor vessel head void growth.

Q #99

ANSWER: B

KA G2.4.7
Knowledge of the event based EOP mitigation strategies. 3.8

10CFR55: 43.b.5

Reference: 3-EOP-ES-0.2, Step 10.a, 17.a.RNO, 18 b & c

Cog Level: 2 Comprehensive
Level 2 because the SRO must relate the loss of the 3A 4KV bus to the present plant conditions and determine that only one CRDM cooling fan is available. He then must relate this knowledge to the effects the CRDM cooling fans have on a natural circulation cooldown and determine that the lower cooldown rates and much higher subcooling numbers must be applied for the given plant conditions as heat removal from the reactor head is diminished with only one CRDM fan..

New Question

Response Analysis:

A. Incorrect because operators should maintain RCS subcooling ≥ 226°F to avoid the possibility of reactor vessel head void formation. Plausible because operators should limit the RCS cooldown rate to 25°F/hr.

B. Correct per the reference

C. Incorrect because operators should limit the RCS cooldown rate to 25°F/hr and maintain RCS subcooling ≥ 226°F to avoid the possibility of reactor vessel head void formation. Plausible because maintaining subcooling > 80°F is an appropriate strategy if both CRDM coolers are in operation and 100°F/hour is the normal cooldown rate limit.

D. Incorrect because operators should limit the RCS cooldown rate to 25°F/hr Plausible because operators should maintain RCS subcooling ≥ 226°F to avoid the possibility of reactor vessel head void formation and 100°F/hour is the normal cooldown rate limit.

Q #100

Unit 4 has experienced a large break LOCA.

There is no indication of current or projected severe core damage.

The RO reports containment pressure has peaked at 28 psig.

The Emergency Coordinator (EC) has NOT yet received any indication of potential radioactive releases from Containment.

Which ONE of the following describes the Protective Action Recommendation (PAR) the EC should make during initial contact with the State?

A. No PAR should be made until confirmation of a radioactive release is made.

B. Shelter all persons within a 2 mile radius of the site and shelter all persons out to 5 miles in the downwind sectors.

C. Evacuate all persons within a 2 mile radius of the site and shelter all persons out to 5 miles in the downwind sectors.

D. Evacuate all persons within a 2 mile radius of the site and evacuate all persons out to 5 miles in the downwind sectors.

REFERENCE PROVIDED

Q #100

ANSWER: B

KA: G2.4.44
Knowledge of emergency plan protective action recommendations. 4.0

10CFR55: 43.b.5

Reference: 3-EPIP-20101, Enclosure 1, Category 1 (General Emergency)
3-EPIP-20101, Step 5.1.4
3-EPIP-20101, Attachment 3, Page 1 of 6

Cog Level: 2 comprehension

Level 2 because the operator must determine that the combination of a large break LOCA with 28 psig inside containment as classifiable as a General Emergency. Then the operator must recall that the minimum classification for a GE, even without a release is "Shelter all persons within a 2 mile radius of the site and shelter all persons out to 5 miles in the downwind sectors."

Provide EPIP-20101, Enclosure 1 as a Reference

New Question

Response Analysis:

A. Incorrect because the EC should issue the PAR to shelter all persons within a 2 mile radius of the site and shelter all persons out to 5 miles in the downwind sectors. Plausible because there is no indication of potential radioactive releases from Containment.

B. Correct per the reference. Minimum PARs for a GE should be made: Shelter all persons within a 2 mile radius of the site and shelter all persons out to 5 miles in the downwind sectors

C. Incorrect because the EC should issue the PAR to shelter all persons within a 2 mile radius of the site and shelter all persons out to 5 miles in the downwind sectors. Plausible because evacuation could be considered more conservative than sheltering in the event of a General Emergency.

D. Incorrect because the EC should issue the PAR to shelter all persons within a 2 mile radius of the site and shelter all persons out to 5 miles in the downwind sectors. Plausible because evacuation could be considered more conservative than sheltering in the event of a General Emergency.