QUESTIONS REPORT
for 2009 RO NRC BANK Submittal 07-20-09

1. 001AA2.05 001/1/2//C/A 4.4/4.6/NEW/R/CR030901/OPS 5-129 OBJ 3

The following plant conditions exist:

- Following a plant runback due to the loss of RCP-1A, an ICS failure occurs.
- AP-504, Integrated Control System Failure, has been entered and the Immediate Actions are complete.
- The plant is now stable.
- Maintenance and Engineering have been contacted.

Twenty minutes later the following conditions are observed:

- Tave is rising
- RCS pressure is rising
- PZR level is rising

Assuming NO additional operator actions have occurred which ONE of the following describes the event in progress and the required operator action?

A. MUV-31 inadvertently opened

Close MUV-596, Common Seal Injection/Makeup Isolation

B. MUV-31 inadvertently opened

Close MUV-27, MUP-1A/1B/1C to RCP-1A Discharge Isolation

C. ✔ Continuous rod withdrawal

Select Sequence Override

D. Continuous rod withdrawal

Start Emergency Boration

001AA2.05 - Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Uncontrolled rod withdrawal from available indications

Reasons:

A. Plausible since MUV-31 failing open will cause PZR level to rise and could cause RCS pressure to rise. Also since the rods are already in manual the candidate may rule out a continuous rod motion event. MUV-596 is a common isolation valve used in EOPs to isolate makeup.

B. Plausible since MUV-31 failing open will cause PZR level to rise and could cause RCS pressure to rise. Also since the rods are already in manual the candidate may rule out a continuous rod motion eventMUV-27 is the downstream isolation valve for MUV-31.

C. Correct. A continuous rod withdrawal will cause all of the above indications. Entry into AP-525, Continuous Rod Motion, is required. Step 3.1, Detail 4, directs the operator to place the Diamond in "Sequence Override".

D. Plausible since the first part of the answer is true. Emergency Boration may temporarily offset the rise in Tave and PZR pressure and level but it will not fix the problem.

OPS 5-129 Obj. 3; AP-525 Step 3.1; AI-500 & AI-505; AP-504 Step 3.3

RO - New

Reference(s) provided: None

2. 003AK1.10 001/1/2/1190302001/C/A 2.6/2.9/BANK/R/CR030901/OPS 5-01 OBJ 2 & 15

The following plant conditions exist due to a *mis-aligned rod*:

- NI-5 upper chamber	42.0%	NI-7 upper chamber	42.4%
- NI-5 lower chamber	43.3%	NI-7 lower chamber	44.4%
- NI-6 upper chamber	43.3%	NI-8 upper chamber	48.0%
- NI-6 lower chamber	44.6%	NI-8 lower chamber	49.4%

Which ONE of the following describes the required *initial* actions IAW ITS 3.2.4, Quadrant Power tilt (QPT)? **(reference provided)**

A. Perform SR 3.2.5.1 once per two hours AND restore QPT to less than or equal to the steady state limit within 24 hours.

B. Reduce thermal power to < 60% of the allowable thermal power within two hours AND reduce the nuclear overpower trip setpoint to ≤ 65.5% of the allowable thermal power within 10 hours.

C. ✔ Reduce thermal power ≥ 2% RTP from the allowable thermal power for each 1% of QPT greater than the steady state limit within 30 minutes AND restore QPT to less than or equal to the transient limit within two hours.

D. Reduce thermal power ≥ 2% RTP from allowable thermal power for each 1% of QPT greater than the steady state limit within two hours AND reduce the nuclear overpower trip setpoint and nuclear overpower based on RCS flow and Axial Power Imbalance trip setpoint ≥ 2% RTP from allowable thermal power for each 1% of QPT greater than the steady state limit.

003AK1.10 - Knowledge of the operational implications of the following concepts as they apply to Dropped Control Rod: Definitions of core quadrant power tilt

Reasons:

QPT = 100 (power in any quadrant/average power of all quadrants -1)

The QPT calculation equals 9. This is greater than the transient limit but less than the maximum limit.

A. Plausible since these are the correct actions to take if the QPT value was calculated between 1.96 and 6.96. NI-5 and NI-7 fall within this range if the QPT calculation used average power divided by any quadrant core power.

B. Plausible since these are the correct actions to take for this QPT value if there was not a mis-aligned rod.

C. Correct. With a mis-aligned rod and QPT value of 9 these are the correct actions to take per TS 3.2.4, Condition B.

D. Plausible since these are alternate actions that could be taken if the QPT value was calculated between 1.96 and 6.96. NI-5 and NI-7 fall within this range if the QPT calculation used average power divided by any quadrant core power.

OPS 5-01 Obj 2 & 15; TS Definitions; TS 3.2.4; COLR

RO - Bank

Reference(s) provided: TS 3.2.4, COLR Page 12

3. 003K6.14 001/2/1/0020102003/MEM 2.6/2.9/BANK/R/CR030901/OPS 4-60 OBJ 3

The following plant conditions exist:

- A plant startup is in progress.
- RCP-1A, RCP-1C, and RCP-1D are running.
- RCP-2B, AC Lift Oil Pump, has tripped.
- All RCP oil reservoirs are at normal level.
- SWP-1C, "C" Nuclear Services Closed Cycle Cooling Pump, is running.
- RCS temperature is 430° F.
- RCS pressure is 1900 psig.
- All RCP seal flows are stable at 6 gpm per pump.

Which ONE of the preceding conditions would *electrically* prevent the start of the "B" Reactor Coolant Pump, RCP-1B?

A. RCP lift oil pressure is too low

B. RCS pressure is too low

C. RCP seal flow is too low

D. ✔ RCS temperature is too low

003K6.14 - Knowledge of the effect of a loss or malfunction on the following will have on the RCPs: Starting Requirements

Reasons:

A. Plausible since RCP-1B is the only RCP that still has two lift oil pumps. If a lift oil pump were to trip on any other RCP then this answer would be correct. Start permissive for lift oil pressure is >110 psig. Either lift oil pump running will satisfy this permissive.

B. Plausible since there are RCS pressure plant curves below which all four RCPs cannot be running but there is no actual electrical start permissive based on RCS pressure.

C. Plausible since RCP seal flow is lower than normal (9-10 gpm) but the start permissive for seal flow is 3 gpm.

D. Correct. RCS temperature when starting the fourth RCP must be greater than 441° F.

OPS 4-60 Obj. 3; OPS 4-60 Section 1-4.0.I.8

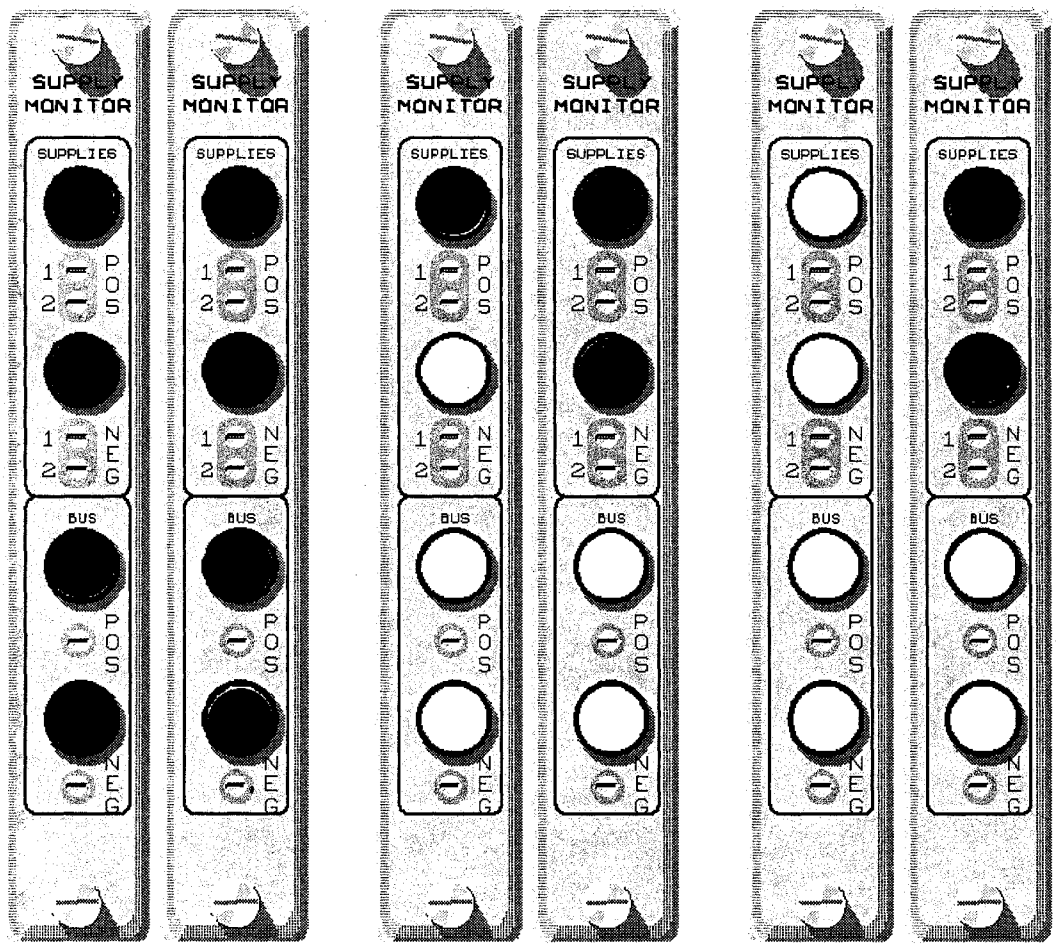
RO - Bank

Reference(s) provided: None

4. 004K2.06 001/2/1//C/A 2.6/2.7/MOD/R/CR030901/OPS 4-09 OBJ 3

With the plant operating at 100% power an electrical transient occurs. The following indications are observed on the NNI and ICS Power Supply Monitors. Based on the indications below which ONE of the following describes the current status of MUV-31? [White indicates light is ON]

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



A. Failed closed

B. Failed open

C. ✔ Automatic control failed, but manual control available.

D. Both manual and automatic control available.

004K2.06 - Knowledge of bus power supplies to the CVCS control instrumentation.

Reasons:

A. Plausible since this represents a possible failure mechanism for a loss of power to the solenoid supplying an air operated valve.

B. Plausible since this represents a possible failure mechanism for a loss of power to the solenoid supplying an air operated valve.

C. Correct. This condition represents a total loss of NNI-X DC power and the loss of one of the DC power supplies for NNI-Y. MUV-31 has a backup power supply (powered from VBDP-3) if NNI-X DC power is lost. The memory module for the control circuitry is frozen to lock up the valve at its current position. Only manual control of the valve is now available.

D. Plausible since the level control signal to MUV-31 swapped to RC-1-LT3 (NNI-Y powered) when NNI-X power was lost so a good level signal is still supplied to the valve. However, the circuitry design for valve operation (memory module frozen) will only allow manual control.

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

RO - Modified

Reference(s) provided: None

5. 005AK3.05 001/1/2//MEM 3.4/4.2/MOD/R/CR030901/OPS 4-28 OBJ 4 & 7

The following plant conditions exist:

- The plant is at 90% power.
- Control rod Group 7 is at 80%.
- Control rod 7-4 drops *10% from the group average.*

Which ONE of the following choices completes the statement below?

___(1)___ reactor power to approximately 60% which ensures that ___(2)___ criteria is not exceeded.

A. (1) An automatic plant runback will occur reducing
(2) local linear heat rate (LHR)

B. (1) An automatic plant runback will occur reducing
(2) DNBR

C.✔ (1) The operator must manually reduce
(2) local linear heat rate (LHR)

D. (1) The operator must manually reduce
(2) DNBR

005AK3.05 - Knowledge of the reasons for the following responses as they apply to the Inoperable / Stuck Control Rod: Power limits on rod misalignment

Reasons:

The rod is inoperable due to being stuck >6.5% mis-aligned from the group average.

A. Plausible since an Asymmetric Fault condition usually results in a plant runback however since the rod did not fully insert into the core no automatic actions occur. Second part of distractor is correct.

B. Plausible since an Asymmetric Fault condition usually results in a plant runback however since the rod did not fully insert into the core no automatic actions occur. Per TS 3.1.4 Bases (1 hour TS) DNBR is not a concern.

C. Correct. Since the rod did not fully insert no automatic runback will occur. Per TS 3.1.4 Bases (1 hour TS) excessive power peaking (local LHR) is a concern.

D. Plausible since the first part of the distractor is correct. Per TS 3.1.4 Bases (1 hour TS) DNBR is not a concern.

OPS 4-28, Obj. 4 & 7; OPS 4-28 Figure 21; TS 3.1.4 and Bases

RO - Modified (Stem and all distractors modified)

Reference(s) provided: None

6. 005K2.01 001/2/1//C/A 3.0/3.2/NEW/R/CR030901/OPS 5-30 OBJ. 1

The following plant conditions exist:

- The plant has shut down for a forced outage to replace a portion of the "A" ES 4160V bus.
- Bus replacement is now in progress and is expected to take 4 days to complete.
- Annunciator window Q-07-06, Plant Line 4 Fault (feed to BEST and Startup transformers), has just annunciated.

Which ONE of the following describes the procedure(s) required to be entered?

AP-404, Loss of Decay Heat Removal
AP-770, Emergency Diesel Generator Actuation
EOP-12, Station Blackout

A. EOP-12 ONLY

B. AP-404 ONLY

C. EOP-12 and AP-770

D.✔ AP-770 and AP-404

005K2.01 - Knowledge of bus power supplies to the DH pumps.

Reasons:

The plant must be in Mode 5 to take an ES bus out of service IAW ITS 3.8.1. Normal power supply to the "B" ES Bus is the Backup ES transformer (BEST). This line is "Plant Line 4".

A. Plausible if the crew thinks both ES buses will remain de-energized.

B. Plausible since AP-404 must be entered due to the loss of the only running DHP but AP-770 must also be entered because the "B" EDG will start following the loss of Plant Line 4.

C. Plausible if the crew thinks both ES buses will remain de-energized. Second part of distractor is correct.

D. Correct. AP-770 should be entered because the loss of Plant Line 4 de-energized the "B" ES bus until the EDG starts and re-energizes the bus. The crew must realize that the plant must be in Mode 5 or 6 to perform this maintenance evolution so DHR will be in progress. Entry into AP-404 is required due to the loss of the running DHP.

OPS 5-30 Obj. 1; AP-770 and AP-404; AR-702 EP 0858

RO - New

Reference(s) provided: None

7. 005K6.03 001/2/1//C/A 2.5/2.6/BANK/R/CR030901/OPS 5-84 OBJ 5

"A" Decay Heat Removal train is in service. Instrument air pressure is 75 psig and lowering.

Which ONE of the following describes the operator response for the above conditions IAW AP-470, Loss of Instrument Air?

Manually throttle DCV-17 (A DH Cooler Bypass Control Valve) ___(1)___ and manually throttle DCV-177 (A DH Cooler Outlet Control Valve) ___(2)___ to limit the initial RCS ___(3)___ .

A. (1) closed
(2) open
(3) heatup

B. (1) open
(2) closed
(3) heatup

C. (1) closed
(2) open
(3) cooldown

D.✔ (1) open.
(2) closed
(3) cooldown

005K6.03 - Knowledge of the effect of a loss or malfunction on the following will have on the Decay Heat System: DH heat exchanger

Reasons:

A. DCV-17 must be throttled open and DCV-177 must be throttled closed to limit RCS cooldown.

B. The concern is RCS cooldown, not heatup.

C. DCV-17 must be throttled open and DCV-177 must be throttled closed.

D. Correct. Opening the bypass valve and closing down on the outlet valve will lower the cooling water flow through the heat exchanger and limit cooldown of the RCS.

OPS 5-84, Obj. 5; AP-470 Step 3.4

RO - Bank

Reference(s) provided: None

8. 006A2.10 002/2/1//MEM 3.4/3.9/NEW/R/CR030901/OPS 3-08 OBJ 4

The following plant conditions exist:

- A large volume add was made to the BWST.
- Chemistry reports that the BWST boron concentration is 1890 ppm.
- The sample results are confirmed by Chemistry.
- RCS boron concentration is 300 ppm.

Which ONE of the following describes the impact of this error on the ability of the Emergency Core Cooling System (ECCS) to maintain adequate Shutdown Margin (SDM) during a LOCA and what procedural guidance would be used to address the potential consequences caused by this condition?

A. SDM could be lost because BWST boron concentration is less than the required concentration.

EOP-13, Rule 6, Reactivity Control, would be used to start an RCS boration from the BWST.

B. SDM will be maintained because BWST boron concentration is greater than RCS boron concentration.

EOP-13, Rule 6, Reactivity Control, would be used to start an RCS boration from the BWST.

C. ✔ SDM could be lost because BWST boron concentration is less than the required concentration.

EOP-13, Rule 6, Reactivity Control, would be used to start an RCS boration from the BASTs.

D. SDM will be maintained because BWST boron concentration is greater than RCS boron concentration.

EOP-13, Rule 6, Reactivity Control, would be used to start an RCS boration from the BASTs.

006A2.10 - Ability to (a) predict the impacts of a low boron concentration in the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of this malfunction or operation.

Reasons:

A. Plausible since the ITS 3.5.4 bases discusses the requirement for the BWST boron concentration limit as adequate to maintain the reactor subcritical in the cold condition during a LOCA. Chapter 14 of the FSAR discusses the potential for loss of SDM and positive reactivity insertion due to the RCS cooldown following a Main Steam Line Break.
EOP-13, Rule 6, Reactivity Control, is performed if an unexpected rise in neutron flux occurs. One of the options for boration is from the BWST.

B. Plausible since the RCS boron concentration is much higher than the RCS boron concentration (1890 ppm BWST vs. 300 ppm RCS). Neglecting the affects of the RCS cooldown and other possible sources of positive reactivity insertion the significantly higher boron concentration could maintain adequate SDM.
EOP-13, Rule 6, Reactivity Control, is performed if an unexpected rise in neutron flux occurs. One of the options for boration is from the BWST.

C. Correct. The ITS 3.5.4 bases discusses the requirement for the BWST boron concentration limit as adequate to maintain the reactor subcritical in the cold condition during a LOCA. Chapter 14 of the FSAR discusses the potential for loss of SDM and positive reactivity insertion due to the RCS cooldown following a Main Steam Line Break.
EOP-13, Rule 6, Reactivity Control, is performed if an unexpected rise in neutron flux occurs. Boration from the BASTs would inject concentrated boric acid to the MUT which would supplement boron injection from the BWST.

D. Plausible since the RCS boron concentration is much higher than the RCS boron concentration (1890 ppm BWST vs. 300 ppm RCS). Neglecting the affects of the RCS cooldown and other possible sources of positive reactivity insertion the significantly higher boron concentration could maintain adequate SDM.
EOP-13, Rule 6, Reactivity Control, is performed if an unexpected rise in neutron flux occurs. One of the options for boration is from the BWST.

9. 006K5.04 001/2/1//C/A 2.9/3.1/NEW/R/CR030901/OPS 5-116 OBJ 2

The following plant conditions exist:

- The plant was at 100% power when a small break LOCA occurred.
- Rule 1, Loss of SCM, has just been completed.
- Current RCS pressure is 1300 psig.
- Current Tincore indication is 425° F.
- RCS cooldown rate is 65° F per 1/2 hr.

Based on these conditions which ONE of the following describes why Rule 4, PTS, is in effect and why HPI flow must be throttled?

Rule 4, PTS, is in effect because ___(1)___. HPI must be throttled to ___(2)___.

A. ✔ (1) HPI flow exists with no RCPs running
(2) prevent exceeding NDT limits

B. (1) ITS cooldown rate was exceeded
(2) prevent exceeding NDT limits

C. (1) HPI flow exists with no RCPs running
(2) lower and maintain RCS pressure below 1000 psig

D. (1) ITS cooldown rate was exceeded
(2) lower and maintain RCS pressure below 1000 psig

006K5.04 – Knowledge of the operational implications of the following concepts as they apply to ECCS: Brittle fracture, including causes and preventative actions

Reasons:

A. Correct. Since the stem states that Rule 1 has been performed then RCPs would have been secured and HPI actuated. This meets the criteria for a PTS event and Rule 4 must be followed. Since adequate SCM now exists (approx 140 degrees) Rule 2, HPI Control, is also in effect. HPI is throttled to prevent exceeding NDT (brittle fracture) limits.

B. Plausible because ITS cooldown rates were exceeded but Rule 4 is NOT in effect based on cooldown rate because RCS temperature is still above 400° F.

C. Plausible because first part of distractor is correct. Also Rule 2 does require HPI to be throttled to maintain RCS pressure < 1000 psig but only if the OTSG has been isolated for TRACC.

D. Plausible because ITS cooldown rates were exceeded but Rule 4 is NOT in effect based on cooldown rate because RCS temperature is still above 400° F. Also Rule 2 does require HPI to be throttled to maintain RCS pressure < 1000 psig but only if the OTSG has been isolated for TRACC.

OPS 5-116 Obj. 2; EOP Cross-Step Document for EOP-13, Rule 2; EOP-13, Rules 2 & 4

RO - New

Reference(s) provided: Steam Tables

10. 007A4.09 001/2/1//C/A 2.5/2.7/BANK/R/CR030901/OPS 4-59 OBJ 3

The following plant conditions exist with the plant at 100% power.

- RB pressure at 0.2 psig and stable
- RB sump level is 12 inches and slowly rising
- RCS pressure is stable
- PZR level is 220 inches and stable
- RCDT level is 103 inches and stable
- RCDT temperature is 127° F and stable
- RCDT pressure is 4.5 psig and stable

Which ONE of the following describes a condition that could result in the above indications?

A. RC-1-LT1 (PZR level transmitter) condensing pot leakage.

B. A Core Flood Tank relief valve has lifted.

C. ✔ RCP Seal leakage is draining to the sump.

D. A small main steam leak is in progress.

007A4.09 - Ability to manually operate and/or monitor in the control room: relationships between PZR level and changing levels of the PRT and bleed holdup tank.

Reasons:

A. Plausible since a leaking condensing pot will cause RB sump level to rise.

B. Plausible since CFT drains are routed to the RCDT, but not CFT relief valves.

C. Correct. Normally RCP Seal leakage drains to the RCDT but per limit and precaution in OP-407J RCDT pressures > 4 psig will cause diversion of RCP seal leak off to the RB sump.

D. Plausible since a main steam leak will cause a rise in RB sump level but will not cause RCDT parameters to rise.

OPS 4-59 Obj. 3; OPS 4-59 Section 1-4.0.A.1; OP-407J, Step 3.2.3

RO - Bank (Oconee)

Reference(s) provided: None

11. 007EA2.02 001/1/1//MEM 3.4/4.6/MOD/R/CR030901/OPS 5-96 OBJ 4

During the Immediate Actions following a reactor trip from 100% power, the following conditions exist:

- Three control rods remain withdrawn.
- Power Range NI average power is approximately 6% and stable.

The reactor operator is performing this step:

"Verify NIs indicate reactor is shutdown".

Which ONE of the following actions would be the *next* action for these conditions IAW EOP-02, Vital System Status Verification?

A. ✔ Manually actuate both trains of HPI for Emergency Boration.

B. Start both Chemical Addition pumps, CAP-1A and 1B, and manually borate RCS through the Batch Controller.

C. De-energize the CRDs by opening breakers 3305 and 3312.

D. Concurrently perform EOP-13, Rule 6, Reactivity Control.

007EA2.02 - Ability to determine or interpret the following as they apply to a reactor trip: Proper actions to be taken if the automatic safety functions have not taken place.

Reasons:

A. Correct. In accordance with the EOP Cross Step document (ECD/bases) for EOP-02, the immediate actions for verifying that the reactor is shut down will observe the NIs for reactor power to be < 5%. Following a reactor trip, power must be less than 5% to satisfy the safety function of the RPS system. If the NIs indicate that reactor power is ≥ 5% power then the reactor is NOT shutdown and contingency actions must be performed to shut down the reactor before immediate actions can be considered complete. The first contingency action for this condition is to manually actuate HPI in order to establish emergency boration which will add negative reactivity to lower reactor power and shut down the reactor.

B. Plausible since manual boration from Chemical Addition will add negative reactivity and it is one of the contingency actions for the NIs indicating ≥ 5% power but boration would be through CAV-60, not the batch controller.

C. Plausible since this is one of the contingency actions of an earlier step in the immediate actions of EOP-02 for an ATWS condition. These actions will de-energize the CRDs by opening the 480V power supply breakers which will cause the control rod groups to drop and shut down the reactor.

D. Plausible since Rule 6, Reactivity Control, will also start CAP-1A and 1B for emergency boration.

OPS-5-96, Obj. 4; EOP-13, Rule 6; EOP-2 Step 2.3

RO - Modified

Reference(s) provided: None

12. 008A1.03 001/2/1//C/A 2.7/2.9/NEW/R/CR030901/OPS 4-56 OBJ 3 & 9

The plant is in *Mode 5* when SWV-199, SW Surge Tank (SWT-1) relief valve, fails open.

Which ONE of the following describes an effect of this failure?

Adequate NPSH for the SW pumps ___(1)___ maintained and entry into TS 3.7.7, Nuclear Services Closed Cycle Cooling Water (SW), ___(2)___ required.

A. (1) is
(2) is

B. ✔ (1) is
(2) is NOT

C. (1) is NOT
(2) is

D. (1) is NOT
(2) is NOT

008A1.03 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS / DCS controls including: CCW pressure.

Reasons:

A. Plausible since first part of distractor is correct. Entry into TS 3.7.7 is only required in Modes 1-4.

B. Correct. On overpressure on this tank is not required to maintain adequate NPSH. Entry into TS 3.7.7 is only required in Modes 1-4.

C. Plausible since some pumps require overpressure on their surge tanks to ensure minimum NPSH requirements. Entry into TS 3.7.7 is only required in Modes 1-4.

D. Plausible since some pumps require overpressure on their surge tanks to ensure minimum NPSH requirements. Second part of distractor is correct.

OPS 4-56 Obj 3 & 9; OPS 4-56 Section 1-4.0.I.d; EDBD Tab 6/11; TS 3.7.7

RO - New

Reference(s) provided: None

13. 008AG2.1.23 001/1/1//C/A 4.3/4.4/NEW/R/CR030901/OPS 5-114 OBJ 7

A plant trip has occurred from 100% power due to the loss of the "B" MFWP. EOP-10, Post Trip Stabilization, is in progress when the following indications are observed:

- RCS pressure is 1900 psig and lowering.
- All PZR heaters are on.
- PZR level is 100 inches and stable.
- Makeup Tank level is lowering at a rate of approximately 15 gpm.
- RCDT level and temperature are rising.
- RB sump, temperature and pressure are normal.

Which ONE of the following choices completes the statements below?

This event could be caused by a ___(1)___ . AP-520, Loss of RCS Coolant or Pressure, should be entered and if the transient can NOT be terminated, then initiate ___(2)___ within 4 hours.

A. (1) PZR spray valve leakby
(2) EOP-08A, LOCA Cooldown

B. (1) PZR steam space leak
(2) EOP-08A, LOCA Cooldown

C. (1) PZR spray valve leakby
(2) OP-209, Plant Cooldown

D. ✔ (1) PZR steam space leak
(2) OP-209, Plant Cooldown

008AG2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation. (PZR Vapor Space Accident)

Reasons:

A. Plausible since the PZR spray valve will open if a MFWP is lost at 100% power. Also a slow RCS pressure reduction with all heaters on and RB parameters normal supports a leaking PZR spray valve. However, MUT level and RCDT parameters support RCS leakage from the PORV or PZR safeties. AP-520 directs the performance of EOP-08A if RCS leakage is > 100 gpm (Step 3.28). The given conditions do not support an RCS leak rate of > 100 gpm.

B. Plausible since AP-520 directs the performance of EOP-08A if RCS leakage is > 100 gpm (Step 3.28). The given conditions do not support an RCS leak rate of > 100 gpm. First part of distractor is correct.

C. Plausible since the PZR spray valve will open if a MFWP is lost at 100% power. Also a slow RCS pressure reduction with all heaters on and RB parameters normal supports a leaking PZR spray valve. However, MUT level and RCDT parameters support RCS leakage from the PORV or PZR safeties. Second part of distractor is correct.

D. Correct. An RCS pressure reduction with rising RCDT level and temperature, and a lowering MUT with all other RCS leak indications normal supports a leaking PZR PORV or PZR safeties (PZR steam space LOCA). AP-520 directs the performance of a plant cooldown within 4 hours if RCS leakage exceeds ITS limits (Step 3.17). The leakage caused by this event is classified as identified leakage but it exceeds the TS limit of 10 gpm. AP-520 will direct closure of the PORV block valve to eliminate the leak. Based on the given conditions this action was either unsuccessful or the leak is from one of the PZR safeties. Therefore, a plant cooldown is required. OP-209, Plant Cooldown, would be used.

OPS 5-114, Obj. 7; AP-520 Steps 3.17 & 3.28

RO - New

Reference(s) provided: None

14. 008K4.02 001/2/1//MEM 2.9/2.9/BANK/R/CR030901/OPS 4-56 OBJ 3 & 9

Which ONE of the following describes the normal method for maintaining/controlling the level in the Nuclear Services Closed Cycle Cooling System Surge Tank (SWT-1)?

A. Manual control by the Primary Plant Operator.

B. Automatic valve control set to maintain level between two setpoints.

C. ✔ Manual operation of the control switch for the fill valve on the Main Control Board.

D. Manual operation of the Demin Water transfer pumps on the Main Control Board.

008K4.02 - Knowledge of SWS / DCS design feature(s) and/or interlock(s) which provide for operation of the surge tank, including the associated valves and controls.

Reasons:

A. Plausible since the Primary Plant Operator can locally fill the SW surge tank but this is not the normal method. Also nitrogen addition to SWT-1 is a manual operation performed by the PPO.

B. Plausible since the DC surge tanks have automatic level control but the SW surge tank does not.

C. Correct. SWV-277 is the valve used for normal fill of the SW surge tank.

D. Plausible since this will have an effect on how fast the surge tank will fill but nothing will happen until SWV-277 is manually selected open.

OPS 4-56 Obj. 3; OPS 4-56 Section 1-4.0.I.2.c

RO - Bank

Reference(s) provided: None

15. 009EK2.03 002/1/1//C/A 3.0/3.3/BANK/R/CR030901/OPS 3-21 OBJ 2

The plant has experienced an RCS leak of approximately 100 gpm. A cooldown to Mode 5 is in progress. RCS temperature trend is shown below.

1200	535° F
1230	500° F
1300	470° F

Which ONE of the following choices completes the statement below?

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

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

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

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

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

009EK2.03 - Knowledge of the interrelations between the small break LOCA and the S/Gs.

Reasons:

A. The cooldown rate is 60° F per hour, which is less than the 50° F per 1/2 hour limit. Also, EOP-8A contains a note that cooldown may be excessive due to HPI flow. However, this note would apply to much larger breaks.

B. The cooldown rate is 60° F per hour, which is less than the 50° F per 1/2 hour limit. Second part of distractor is correct.

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

D. Correct. The cooldown rate is acceptable at 60° F per hour (30° F per 1/2 hour). With a LOCA of 100 gpm, some HPI/break cooling would occur but OTSG heat removal would still be required.

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

RO - Bank (NRC 2007)

Reference(s) provided: None

16. 010K5.01 001/2/1//MEM 3.5/4.0/BANK/R/CR030901/OPS 4-60 OBJ 7

The following plant conditions exist:

- PZR temperature is 635° F
- T_{incore} is 604° F
- T_{hot} is 600° F
- T_{cold} is 555° F

Which ONE of the following identifies the approximate RCS pressure for these conditions?

A. 1100 psig

B. 1550 psig

C. 1588 psig

D. ✔ 1974 psig

010K5.01 - Knowledge of the operational implications of the following concepts as the apply to the PZR PCS: Determination of condition of fluid in PZR, using steam tables

Reasons:

A. Plausible since this is Psat for a Tcold temp of 555° F

B. Plausible since this is Psat for a Thot temp of 600° F.

C. Plausible since this is Psat for a Tincore temp of 604° F.

D. Correct. Psat for this current PZR temp of 635° F.

OPS 4-60 Obj. 7; OPS 4-60 Section 1-4.0.E

RO - Bank

Reference(s) provided: Steam tables

17. 011EK3.07 001/1/1//MEM 3.5/3.6/NEW/R/CR030901/OPS 5-85 OBJ 3

The following plant conditions exist:

- A loss of all offsite power has occurred.
- After the plant trip a large break LOCA occurs.

Which ONE of the following describes the reason the MUP recirc to MUT (MUV-53 and 257) valves are closed for these conditions?

A. HPI pump runout is avoided.

B. EDG maximum loading is not exceeded.

C.✔ Maximum HPI flow to the RCS is achieved.

D. Balanced HPI flow through all injection valves is achieved.

011EK3.07 – Knowledge of the reasons for the following responses as they apply to the Large Break LOCA: Stopping HPI bypass flow

Reasons:

A. Plausible since pump runout is a concern however downstream HPI throttle valves have been installed and are tack welded in position.

B. Plausible since EDG loading is a concern however Rule 5, Diesel Load Control, and downstream HPI throttle valves limit EDG loading.

C. Correct. Per the DBD, Chapter 6/2, this is the reason for closing the recirc valves.

D. Plausible since balanced HPI flow is a concern should an injection line break occur however downstream HPI throttle valves have been installed and are tack welded in position.

OPS 5-85 Obj. 3; EDBD Chapter 6/2

RO - New

Reference(s) provided: None

18. 012G2.4.6 001/2/1//MEM 3.7/4.7/NEW/R/CR030901/OPS 5-14 OBJ 6

The following plant conditions exist:

- The plant was operating at 100% power when the "B" MFWP tripped.
- AP-545, Plant Runback, was entered.
- During the runback the PORV opened and operated as designed.

Which ONE of the following describes the required actions for this event?

A. ✔ Manually trip the reactor and enter EOP-02, Vital System Status Verification.

B. Verify plant conditions are approaching stability and complete AP-545, Plant Runback.

C. Ensure AMSAC actuation has occurred and enter EOP-02, Vital System Status Verification.

D. Perform OP-507, Operation of the ES, RPS, and ATWS Systems.

012G2.4.6 – Knowledge of EOP mitigation strategies. (Reactor Protection)

Reasons:

A. Correct. Based on the plant conditions a reactor trip setpoint was exceeded. The setpoint for PORV opening is 2450 psig. The High Pressure RPS trip setpoint is 2355 psig. EOP mitigation strategy requires a manual reactor trip if a reactor trip is called for (i.e. exceeding an RPS setpoint). EOP-02 is used when a reactor trip occurs or if a reactor trip is called for.

B. Plausible since the setpoints for PORV opening and High Pressure Rx trip are close (2450 psig vs. 2355 psig). Also, based on the fact that the plant did not trip, designed for a loss of 1 MFWP at power, it may make sense not to introduce another transient.

C. Plausible since AMSAC is a sub-set of the ATWS system. The setpoint for an AMSAC actuation is RTP > 50% and FW flow < 17%. There would be a 1/2 trip of AMSAC however a full actuation requires a 2/2 logic. MFW flow would need to be < 17% flow to both OTSGs to satisfy the logic. Only the "B" OTSG flow would be < 17%. AMSAC will trip the main turbine and since reactor power is > 45% a reactor trip would occur if AMSAC actuates.

D. Plausible since the conditions given demonstrate a problem with the RPS system. OP-507 provides guidance for addressing operational issues with the RPS system.

OPS-5-14, Obj. 6; OPS-4-12, Obj. 10; AI-505 Step 3.2.4 and Enclosure 1; OP-305 Step 3.1.1

RO - New

Reference(s) provided: None

19. 012K5.01 001/2/1//MEM 3.3/3.8/NEW/R/CR030901/OPS 4-12 OBJ 11

Calibration of the RPS trip modules is in progress.

Which ONE of the following "As Found" trip setpoints could have resulted in a departure from nucleate boiling (DNB) event?
(consider each setpoint independently)

A. ✔ Thot trip setpoint of 625° F.

B. High RCS pressure trip setpoint of 2400 psig.

C. Flux/delta flux/flow trip setpoint corresponding to -20% imbalance at 80% power.

D. Flux/delta flux/flow trip setpoint corresponding to +20% imbalance at 80% power.

012K5.01 - Knowledge of the operational implications of the following concepts as they apply to the RPS: DNB

Reasons:

A. Correct. Normal high temp setpoint is 618° F. At NOTP 625° F is to the right of safety limit curve Figure 2.1.1-1.

B. Plausible since this value is above the normal high pressure trip setpoint however maintaining a higher RCS pressure actually raises the DNBR.

C. & D. Plausible since imbalance limits are required to ensure a DNB event does not occur however the values given are within the protective limit as described in the COLR and Reactor Core Safety Limit 2.1.1.2.

OPS 4-12 Obj. 11; TS 2.1.1.2 & 2.1.1.3, COLR

RO - New

Reference(s) provided: None

20. 013K2.01 001/2/1/0130502001/C/A 3.6/3.8/BANK/R/CR030901/OPS 4-13 OBJ 5

The following plant conditions exist:

- Plant is at 100% full power.
- ES Channel 3 "Pressure Test Module" is selected to the "Test/Operate" position for maintenance.
- The plant now experiences a loss of VBDP-3.

Which ONE of the following describes the status of the ES system?

A. Only ES Channel 1 will be tripped; no ES actuation will occur.

B. Only ES Channel 3 will be tripped; no ES actuation will occur.

C.✔ Both ES Channels 1 and 3 will be tripped; both "A" and "B" train HPI and LPI actuations will occur.

D. Both ES Channels 1 and 3 will be tripped; both "A" and "B" train HPI, LPI and RBIC actuations will occur.

013K2.01 - Knowledge of bus power supplies to the ESFAS / safeguards equipment control.

Reasons:

A. Plausible since ES Channel 1 will be tripped due to the loss of VBDP-3.

B. Plausible since ES Channel 3 will be tripped because its RCS pressure test module is selected to "Test/Operate".

C. Correct. Channel 1 would be tripped due to the loss of VBDP-3. Channel 3 would also be tripped because its RCS pressure test module is selected to "Test/Operate". Both "A" and "B" Train actuations will occur with the exception of RBIC.

D. Plausible since both channels will be tripped and an ES actuation will occur. However the pressure test module is associated with RCS pressure, NOT RB pressure, so an RBIC actuation will not occur.

OPS 4-13 Obj 5; OPS 4-13 Sections 1-2.0.A.6, 1-2.0.B.1, 1-4.0.E.5; OP-700D Page 12; Task # 0130502002

RO - Bank (two distractors modified for plausibility)

Reference(s) provided: None

21. 015/017AK1.05 001/1/1//C/A 2.7/3.3/NEW/R/CR030901/OPS 4-14 OBJ 4

The following plant conditions exist:

- The plant is at 32% power.
- Delta Tc indicates that "B" OTSG is 5° F hotter than "A" OTSG.

Which ONE of the following choices completes the statements below?

This indication could be caused by a loss of the ___(1)___ RCP. Continued operation with these conditions will cause ___(2)___ concerns.

A. ✔ (1) "B"
(2) QPT

B. (1) "C"
(2) QPT

C. (1) "B"
(2) axial power imbalance

D. (1) "C"
(2) axial power imbalance

015/017AK1.05 – Knowledge of the operational implications of the following concepts as they apply to RCP malfunction (Loss of RC Flow): Effects of unbalanced RCS flow on in-core average temperature, core imbalance, and quadrant power tilt.

Reasons:

For these conditions the "A" OTSG is on LLL. This is caused by a loss of either the "A" or "B" RCP. Either OTSG on LLL blocks the integral and proportional action of the delta Tcold circuit. The Total FW Flow Control circuit is in effect decreasing FW flow to the "B" OTSG to maintain total FW flow compatible with reactor power. Delta Tc indication below mid-scale shows the "B" OTSG Tcold being hotter than the "A" OTSG Tcold.

A. Correct. At this power level a loss of "A" or "B" RCP will cause these indications. QPT is the concern per the EDBD.

B. Plausible since the operator must determine what the delta Tc indication is showing him and determine which combination of RCPs could cause this indication. Also the second part of the distractor is correct.

C. Plausible since first part of distractor is correct and second part of distractor would also be correct if power level was > 40%.

D. Plausible since the operator must determine what the delta Tc indication is showing him and determine which combination of RCPs could cause this indication. Also the second part of distractor would be correct if power level was > 40%.

OPS 4-14, Obj. 4; OPS 4-14 Sections 1-4.0.H.8.b)4) and 1-4.0.H.8.c)2); EDBD Chapter 5/4 Pages 25 and 44; TS 3.2.3 & 3.2.4

RO - New

Reference(s) provided: None

22. 015K3.01 001/2/2/1150402016/C/A 3.9/4.3/MOD/R/CR030901/OPS 4-10 OBJ 3 & 5

The plant is operating at 34% power with a -6% imbalance.

Which ONE of the following describes the RPS response if the upper chamber of NI-7 fails?

If NI-7 upper chamber fails ___(1)___ , the associated RPS channel would trip due to a large ___(2)___ imbalance. **(reference provided)**

A. ✔ (1) high
(2) positive

B. (1) low
(2) positive

C. (1) high
(2) negative

D. (1) low
(2) negative

015K3.01 - Knowledge of the effect that a loss or malfunction of the NIS will have on the following: RPS

Reasons:

At 34% power with a -6% imbalance the upper chamber must indicate 14% power with the bottom chamber indicating 20% power.

A. Correct. A high failure will result in a large positive imbalance.
72% - 20% = +52% imbalance, well outside the trip envelope.

B. A low failure will result in a large negative imbalance.

C. A high failure will result in a large positive imbalance.

D. A low failure will result in a large negative imbalance but not large enough to trip the flux/delta flux/flow bistable. 0% - 20% = -20% imbalance

COLR; OPS 4-10 Section 1-4.0.C; Task # 0120402007

RO - Modified

Reference(s) provided: Imbalance curve from COLR

23. 016A4.02 001/2/2/0160102005/C/A 2.7/2.6/BANK/R/CR030901/OPS 4-09 OBJ 3 & 4

The following plant conditions exist:

- The plant is at 100% power.
- RC-1-LT1, PZR level transmitter, is selected for control.
- "SASS Mismatch" annunciator alarms and does not clear.
- Investigation reveals the amber "Mismatch" lamp to be lit on the Pressurizer Level channel.
- All other lamps in that channel and all other "Mismatch" lamps are off.

Current PZR level readings are as follows: RC-1-LIR-1 = 220"
RC-1-LIR-3 = 228"

RIP indications match MCB indications.

Which ONE of the following choices completes the statement below?

The alarm is:

A. valid. SASS has functioned properly.

B. valid. However, SASS should have also selected RC-1-LT3 for control.

C. NOT valid. The operator should depress the "Annunciator Reset" pushbutton to return the channel to normal operation.

D. ✔ NOT valid. The operator should issue a work request on the SASS channel.

016A4.02 - Ability to manually operate and/or monitor in the control room: Recorders (NNI)

Reasons:

Mismatch alarm is 3% of scale (9.6") between level transmitters. The signal provided to SASS uses a different amplifier than that of the MCB level recorders. The signal on the RIP is the same signal provided to SASS. The SASS Mismatch alarm should NOT be in.

A. Plausible if the student thinks the mismatch signal to SASS is 3" instead of 3%.

B. Plausible if the student thinks the mismatch signal to SASS is 3" instead of 3%.

C. Plausible since first part of distractor is correct. Additionally depressing the "Annunciator Reset" pushbutton will clear a SASS Transfer alarm, but not a SASS Mismatch alarm

D. Correct. Alarm is not valid and a work request should be written for this failure.

OPS 4-09 Obj. 3 & 4; OPS 4-09 Section 1-4.0.B; OP-501 Enclosure 3, Page 3; OP-501 Step 4.7.2; Task # 0160402005

RO - Bank

References provided: None

24. 017K5.02 001/2/2/0170502001/C/A 3.7/4.0/BANK/R/CR030901/OPS 4-11 OBJ 2

The following plant conditions exist:

- RCS pressure is 386 psig
- T_{incore} (CET) is 520° F

Which ONE of the following describes the CET inputs to subcooling margin indications and the status of core cooling?

A. The average of the 16 core exit thermocouples input to the Subcooling Margin Monitor indicates that subcooling margin has been lost but the core is being adequately cooled.

B. The average of the 8 core exit thermocouples input to each Subcooling Margin Monitor indicates that subcooling margin has been lost but the core is being adequately cooled.

C. The highest one of the 16 core exit thermocouples input to each channel of SPDS indicates that an inadequate core cooling event is in progress.

D.✔ The highest one of the 8 core exit thermocouples input to each channel of SPDS indicates that an inadequate core cooling event is in progress.

017K5.02 - Knowledge of the operational implications of the following concepts as they apply to the ITM system: Saturation and subcooling of water

Reasons:

A. & B. The SMM display is a slave fed from the SPDS which uses the highest of the 8 core exit thermocouples for indication. For this pressure and temperature the core is not adequately being cooled.

C. The incore input used for SCM on each channel of SPDS is the highest of 8 incores that actually input to SPDS. The average of these 8 is displayed on the Alpha pages.

D. Correct. The incore input used for SCM on each channel of SPDS is the highest of 8 incores that actually input to SPDS. Steam tables should be adequate to determine superheated conditions in the core.

OPS 4-11 Section 1-4.C; EOP-7 Figure 3

RO - Bank

Reference(s) provided: Steam Tables

25. 022AK1.03 001/1/1//C/A 3.0/3.4/NEW/R/CR030901/OPS 4-52 OBJ 3

The following plant conditions exist:

- Plant is at 100% power.
- PZR level has risen to 240 inches due to a minor FW control problem.
- AP-504, Integrated Control System Failure, has been entered and the plant is stable.
- Alarm window H-04-08, Makeup Valves Air Failure, has just annunciated for MUV-31 due to air pressure at its positioner lowering to 20 psig.

Which ONE of the following describes the PZR level and MUV-31 response to the above conditions?

PZR level will ___(1)___ due to MUV-31 being locked in the ___(2)___ position. Operation of MUV-31 from the MCB is ___(3)___ .

A. ✔
(1) lower
(2) closed
(3) available

B.
(1) lower
(2) throttled
(3) unavailable

C.
(1) rise
(2) open
(3) available

D.
(1) rise
(2) throttled
(3) unavailable

022AK1.03 - Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup: Relationship between makeup flow and PZR level

Reasons:

If positioner air pressure for MUV-31 lowers to < 32 psig the valve will lock in place and cause the Bailey control station to go to Manual. While depressing the Air Fail Reset pushbutton manual operation of MUV-31 is available.

A. Correct. With PZR level rise to 240" MUV-31 should have automatically closed. Due to the loss of air pressure the valve will stay closed and PZR level will lower. Manual operation is available as described above.

B. Plausible since MUV-31 is normally throttled to control PZR level. Also MUV-31 is one of the few air valves equipped with an air failure protection scheme.

C. Plausible if the operator believes that this valve fails open on a loss of air. Second part of distractor is correct.

D. Plausible if the operator is unaware that this particular valve is equipped with an air failure protection scheme.

OPS 5-52, Obj. 3; OPS 4-52 Sections 1-4.0.G.3 and 1-4.0.X.5; AR-403, EP 1095

RO - New

Reference(s) provided: None

26. 022K4.01 001/2/1//MEM 2.5/3.0/NEW/R/CR030901/OPS 4-63 OBJ 3

Which ONE of the following describes how the discharge air temperature of the Penetration Cooling Fans (AHF-9A & 9B) is controlled?

A. Running fan's discharge dampers modulate to control discharge air temperature.

B. Standby fan auto starts when discharge air temperature reaches its high setpoint.

C. ✔ Chilled Water (CH) supply to the cooling coils is adjusted to control discharge air temperature.

D. Nuclear Services Closed Cycle Cooling Water (SW) supply to the cooling coils is adjusted to control discharge air temperature.

022K4.01 - Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Cooling of reactor building penetrations.

Reasons:

A. Plausible since some fans do have modulating discharge dampers used to control temperature.

B. Plausible since some fans auto start based on temperature and/or flow. These fans have an auto shutdown on high temperature, not an auto start on high temperature.

C. Correct. CH flow is adjusted to maintain 60° F discharge temperature.

D. Plausible since the cooling water supply to all other AB and RB fans is SW.

OPS 4-63 Obj 3; OPS 4-63 Sections 2-2.0.A, 2-3.0.A & 2-4.0.A

RO - New

Reference(s) provided: None

27. 025AA2.01 001/1/1//MEM 2.7/2.9/MOD/R/CR030901/OPS 4-54 OBJ 5

The following plant conditions exist:

- The RCS is in a draindown condition with level at 133 feet.
- DHP-1A discharge flow is rapidly oscillating between 1600 and 2000 gpm.
- Annunciator window A-03-06, DH Pump A Flow Low, is cycling in and out of alarm.

Which ONE of the following describes the cause for this alarm and the action that should be taken IAW OP-404, Decay Heat Removal System?

A. DH flow rate is below low flow alarm setpoint

Trip DHP-1A

B. DH flow rate is below low flow alarm setpoint

Throttle open DHV-110 (DHP-1A discharge control valve) to raise flow

C. ✔ DHP amperage is below operator set low amperage alarm setpoint

Trip DHP-1A

D. DHP amperage is below operator set low amperage alarm setpoint

Throttle open DHV-110 (DHP-1A discharge control valve) to raise flow

025AA2.01 - Ability to determine and interpret the following as they apply to the Loss of Decay Heat Removal System: Proper amperage of running LPI/decay heat removal/RHR pump(s)

Reasons:

A. Plausible since 1600 gpm flow is lower than normal however the low flow alarm setpoint is 1500 gpm. Tripping the DHP due to signs of cavitation is the correct action to take per OP-404, Step 3.2.2.

B. Plausible since 1600 gpm flow is lower than normal however the low flow alarm setpoint is 1500 gpm. Also opening DHV-110 would be an acceptable action per AR-301, EP 0225, and this action would probably clear the alarm, but with evidence of cavitation the limit and precaution in OP-404 takes precedence.

C. Correct. Since flow is not below 1500 gpm then the only other possible cause for this alarm is the operator set low amperage alarm. With evidence of cavitation tripping DHP-1A is the correct action per OP-404, Step 3.2.2.

D. Plausible since opening DHV-110 would be an acceptable action per AR-301, EP 0225, and this action would probably clear the alarm, but with evidence of cavitation the limit and precaution in OP-404 takes precedence. First part of distractor is correct.

OPS 4-54 Obj. 5; OPS 4-54 Section 1-5.0.B; AR-301 EP 0225

RO - Modified

Reference(s) provided: None

28. 026A1.01 001/2/1//MEM 3.9/4.2/NEW/R/CR030901/OPS 4-13 OBJ 2

The following plant conditions exist:

- While in EOP-4, Inadequate Heat Transfer, attempting to restore EFW a LOCA occurred causing a loss of adequate SCM.
- Lowest RCS pressure was 1700 psig.
- Highest RB pressure was 3 psig.
- EOP-3, Inadequate Subcooling Margin, has now been entered and Rule 1, Loss of SCM, is complete.

Which ONE of the following choices completes the statement below?

Currently BSV-3 and 4 (BS flow control valves) are __(1)__ and if RB pressure exceeds 30 psig BSP-1A and 1B will __(2)__.

A. ✔ (1) open
(2) auto-start

B. (1) throttled
(2) auto-start

C. (1) open
(2) NOT auto-start

D. (1) throttled
(2) NOT auto-start

026A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the BSS controls including: Reactor Building pressure

Reasons:

An automatic HPI and RBIC have not occurred but a manual actuation of HPI and RBIC should have been performed during the performance of Rule 1. Manual HPI will activate Block 6 and arm the BSPs for start. BSVs will control at their 1500 gpm setpoint but at this time, with no BS flow, the valves will stroke full open.

A. Correct. With no BS flow BSV-3 and 4 will be full open and the BSPs will start since the manual HPI actuation completed the arming sequence.

B. Plausible since BSV-3 and 4 are normally throttled maintaining flow at setpoint.

C. Plausible since the first portion of the distractor is correct. Student must also remember that Rule 1 actions require a manual HPI (which arms BSPs in Block 6).

D. Plausible since BSV-3 and 4 are normally throttled maintaining flow at setpoint. Student must also remember that Rule 1 actions require a manual HPI (which arms BSPs in Block 6).

OPS 4-13 Obj. 2; OPS 4-13 Sections 1-5.0.F.7.e and 1-5.0.15.h; Rule 1

RO - New

Reference(s) provided: None

29. 026AK3.02 001/1/1//MEM 3.6/3.9/NEW/R/CR030901/OPS 4-56 OBJ 4

Which ONE of the following describes the response of the SW system associated with RCPs following an ES RBIC actuation and the reason for this response?

SW cooling to the RCPs will automatically isolate ___(1)___ to ensure ___(2)___ .

A. ✔ (1) if the RBIC actuation is coincident with low SWT-1 level
(2) any leakage through the flow path to the RCPs is isolated

B. (1) due to the RBIC actuation ONLY
(2) any leakage through the flow path to the RCPs is isolated

C. (1) if the RBIC actuation is coincident with low SWT-1 level
(2) elimination of heat input from all sources in the RB except for the ES actuated AHFs-1A/B/C

D. (1) due to the RBIC actuation ONLY
(2) elimination of heat input from all sources in the RB except for the ES actuated AHFs-1A/B/C

026AK3.02 - Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Services / Decay Heat Closed Cycle Cooling: The automatic actions (alignments) within the SWS / DCS resulting from the actuation of the ESFAS

Reasons:

A. Correct. SW cooling to the RCPs is isolated if RBIC occurs coincident with SWT-1 level < 8'6" in order to ensure that any leakage from this flowpath (cooling to the RCPs) is isolated.

B. Plausible since RCPs are tripped during verification of RBIC (due to loss of CBO), and that any leakage from this flowpath (cooling to the RCPs) is isolated.

C. Plausible since SW cooling to the RCPs is isolated if RBIC occurs coincident with SWT-1 level < 8'6" and all other RB heat loads on the SW system are isolated to preserve cooling for the RB cooling system in a design basis accident. However FSAR Chapter 9 states that the reason for the isolation is to ensure any leakage from this flowpath (cooling to the RCPs) is isolated.

D. Plausible since RCPs are tripped during verification of RBIC (due to loss of CBO), and all other RB heat loads on the SW system are isolated to preserve cooling for the RB cooling system in a design basis accident.

OPS 4-56 Obj. 4; OPS 4-56 Section 1-4.0.I.4; FSAR Chapt 9 (9.5.2.1.5)

RO - New

Reference(s) provided: None

30. 027AK3.04 001/1/1//C/A 2.8/3.3/BANK/R/CR030901/OPS 4-60 OBJ 3

The following plant conditions exist:

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

Which ONE of the following describes the response of RCS pressure over the next five minutes?

A. Rise because spray flow has been minimized with the trip of RCP-1B.

B. Rise because pressurizer heaters are raising pressurizer temperature.

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

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

027AK3.04 - Knowledge of the reasons for the following responses as they apply to the PZR Pressure Control Malfunctions: Why, if PZR level is lost and then restored, that pressure recovers much more slowly.

Reasons:

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

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

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

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

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

RO - Bank

Reference(s) provided: Steam Tables

31. 027K1.01 001/2/2//MEM 3.4/3.7/NEW/R/CR030901/OPS 4-62 OBJ 3

Which ONE of the following describes the function of the trisodium phosphate dodecahydrate (TSP) baskets located on the 95' elevation of the Reactor Building (RB)?

The TSP baskets add chemicals which ___(1)___ the PH of the water in the RB to limit _____(2)_____ .

A. ✔ (1) raise
(2) iodine revolatization when sprayed back into the RB atmosphere

B. (1) lower
(2) iodine revolatization when sprayed back into the RB atmosphere

C. (1) raise
(2) the production of hydrogen when injected back into the RCS

D. (1) lower
(2) the production of hydrogen when injected back into the RCS

027K1.01 Knowledge of the physical connections between the CIRS and the following systems: CSS

Reasons:

A. Correct. The TSP baskets on the 95' elevation of the RB add chemicals that raise the PH of the effluent returning to the ECCS recirc sump. Raising the PH ensures that iodine captured in the Building Spray droplets does not re-evolve from solution when it is sprayed back into the RB atmosphere.

B. Plausible since the main purpose of adding the chemicals is to change the PH of the effluent returning to the RB sump in order to prevent iodine from re-volatizing in the RB atmosphere when it is subsequently recirculated through the Building Spray system.

C. Plausible since another purpose of the TSP baskets is to release chemicals to the effluent returning to the RB sump in order to minimize corrosion of mechanical system components. The zirc water reaction releases hydrogen under high temperature corrosion process.

D. Plausible since another purpose of the TSP baskets is to release chemicals to the effluent returning to the RB sump in order to minimize corrosion of mechanical system components. The zirc water reaction releases hydrogen under high temperature corrosion process.

This range ensures the iodine does not re-evolve from the solution during the ECCS recirculation phase without introducing conditions that may induce caustic stress corrosion cracking of mechanical system components.

OPS 4-62, OBJ 3; OPS 4-62 Sections 1-3.0.D & 1-10.0.B

RO - NEW

Reference(s) provided - None

32. 028A2.02 001/2/2//MEM 3.5/3.9/NEW/R/CR030901/OPS 3-25 OBJ 3

Which ONE of the following identifies the temperature at which *significant* hydrogen production will begin to occur in the RCS during Inadequate Core Cooling conditions and describes a consequence of the rising volume of hydrogen?

Significant hydrogen production in the RCS does NOT occur until Tincore temperature exceeds ___(1)___ and can ___(2)___ during the initial stages of Inadequate Core Cooling.

A. (1) 1400° F
(2) hinder OTSG boiler condenser cooling

B. ✔ (1) 1800° F
(2) hinder OTSG boiler condenser cooling

C. (1) 1400° F
(2) be a threat to RB design pressure

D. (1) 1800° F
(2) be a threat to RB design pressure

028A2.02 - Ability to (a) predict the impacts of the following malfunctions or operations on the HRPS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: LOCA condition and related concern over hydrogen

Reasons:

A. Plausible since the zirc water reaction will begin to produce hydrogen at core temperatures of approximately 1400° F. Also plausible since any significant amount of hydrogen produced if not vented or lost through the break will accumulate first in the reactor head and then in the RCS hot legs. This will prevent primary to secondary heat transfer by blocking natural circulation and displacing the steam/water vapor in the hot legs which will hinder and ultimately block boiler condenser cooling.

B. Correct. The zirc water reaction will begin to produce hydrogen at core temperatures of approximately 1400° F. Significant production of hydrogen in the RCS occurs when the core exceeds 1800° F, and becomes self-sustaining when the core temperature exceeds 2200° F. Any significant amount of hydrogen produced if not vented or lost through the break will accumulate first in the reactor head and then in the RCS hot legs. This will prevent primary to secondary heat transfer by blocking natural circulation and displacing the steam/water vapor in the hot legs which will hinder and ultimately block boiler condenser cooling.

C. Plausible since the zirc water reaction will begin to produce hydrogen at core temperatures of approximately 1400° F. Also plausible since the production of hydrogen can leak out of the RCS through the break and over time raise the hydrogen concentration in the RB atmosphere to an explosive level which, if ignited, could raise RB pressure.

D. Plausible since the zirc water reaction will begin to produce hydrogen at core temperatures of approximately 1400° F. Significant production of hydrogen in the RCS occurs when the core exceeds 1800° F, and becomes self-sustaining when the core temperature exceeds 2200° F. Also plausible since the production of hydrogen can leak out of the RCS through the break and over time raise the hydrogen concentration in the RB atmosphere to an explosive level which, if ignited, could raise RB pressure.

OPS-3-25, Obj. 3; OPS 3-25 Sections 1-4.0.C.2, 1-5.0.E.1)d) & 1-6.0.G

RO - New

Reference(s) provided: None

33. 029EA1.12 001/1/1//MEM 4.1/4.1/NEW/R/CR030901/OPS 5-96 OBJ 6

An ATWS event has occurred.

Which ONE of the following describes the required actions to be performed IAW EOP-2, Vital System Status Verification, and the EOP Cross-Step document?

Depress the manual Rx trip push button and verify:

A. ✔ control rod groups 1 through 7 are fully inserted.
If any control rod group has NOT fully inserted then open breakers 3305 and 3312.
If breaker 3305 does not open then open additional breakers as required to *de-energize* the CRDs.

B. control rod groups 1 through 7 are fully inserted.
If any control rod group has NOT fully inserted then open breakers 3305 and 3312.
If breaker 3305 does not open then start emergency boration and ensure adequate primary to secondary heat transfer is maintained.

C. all control rods are fully inserted.
If any control rod has NOT fully inserted then open breakers 3305 and 3312.
If the associated buses remain energized then open additional breakers as required to *de-energize* the CRDs.

D. all control rods are fully inserted.
If any control rod has NOT fully inserted then open breakers 3305 and 3312.
If the associated buses remain energized then start emergency boration and ensure adequate primary to secondary heat transfer is maintained.

029EA1.12 - Ability to operate and monitor the following as they apply to an ATWS: Reactor trip breakers

Reasons:

A. Correct. Immediate Action steps of EOP-2 require the opening of breakers 3305 and 3312 if a control rod GROUP has not fully inserted. If these actions are not successful the TBD states that additional breakers should be opened until the CRDs are successfully de-energized.

B. Plausible since the first steps are correct per EOP-2. Emergency boration is addressed in the third Immediate Action if the reactor does not indicate shutdown. However, with the conditions given, additional breakers should be opened to de-energize the CRDs prior to continuing on to the third Immediate Action step.

C. Plausible since all rods are expected to insert when the reactor is tripped. However, due to the power supply arrangement to the CRDs, a single rod, or random multiple rods, failing to insert is not indicative of failure of the CRD breakers to open.

D. Plausible since all rods are expected to insert when the reactor is tripped. Emergency boration is performed in Immediate Action Step 2.3 if the reactor is not shutdown. Also Step 3.4 requires boration if >1 control rod is not fully inserted.

OPS 5-96 Obj. 6; EOP-2 Steps 2.2, 2.3 & 3.4; EOP-2 Cross Step Document

RO - New

Reference(s) provided: None

34. 033A1.01 001/2/2/1150202001/C/A 2.7/3.3/BANK/R/CR030901/OPS 4-29 OBJ 2 & 3

The following plant conditions exist:

- The "B" Decay Heat Train is in operation.
- The Borated Water Storage Tank (BWST) recirculation in progress using SFP-2.
- A Reactor Building (RB) purge is started.
- Refueling operations are in progress.
- The RB Equipment hatch is installed.
- Annunciator G-08-01, Spent Fuel Pool Level High/Low, and G-08-03, Cask Area Level High/Low, have come into alarm.
- NO other alarms are indicated.

Which ONE of the following could be the cause of this condition?

A. The "B" DHHE failed to the full cooling mode which caused SF Pool temperature to lower.

B. The transfer canal deep end drain valves are leaking.

C.✔ The purge has lowered pressure in the RB.

D. BOTH Spent Fuel Heat Exchangers were aligned for cooling which caused SF Pool temperature to lower.

033A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating Spent Fuel Pool Cooling System controls including: Spent fuel pool water level.

Reasons:

A. Plausible since SF temperature will lower if the operating DHHE cooler fails to the full cooling mode but additional level alarms will also be in.

B. Plausible since this will cause the SF pool water level to lower but there would be additional alarms in for Transfer Canal level, RB sump level and the RB sump pumps operating.

C. Correct. Starting the RB purge may draw water into the transfer canal thus raising its level and lowering SF pool level.

D. Plausible since SF temperature will lower if both heat exchangers are placed in service but additional level alarms will also be in.

OPS 4-29 Obj. 2 & 3; AR-402 EPs 0341, 0345 & 0347

RO - Bank

Reference(s) provided: None

35. 034G2.2.40 001/2/2//C/A 3.4/4.7/NEW/R/CR030901/OPS 5-01 OBJ 15

Which ONE of the following fuel assemblies can be stored in a Spent Fuel Pool without entering a Technical Specification action? **(reference provided)**

Assy.	Enrichment (%)	Burnup (MWD/KgU)	Configuration	Pool
1	4.5	2.0	Checkerboard with any Category B assembly	A
2	2.0	2.0	Checkerboard with any Category A or B assembly	B
3	3.5	3.0	Side by Side with any Category B or F assembly	A
4	3.0	3.0	Side by Side with any Category B assembly	B

A. ✔ 1

B. 2

C. 3

D. 4

034G2.2.40 – Ability to apply Technical Specifications for a system. (Fuel Handling Equipment)

Reasons:

A. Correct. ITS 3.7.15 Figure 1. This is a Category F assembly and must be stored in a checkerboard pattern with fuel assemblies from Category B or empty water cells.

B. Plausible since an assembly with this enrichment and burnup could be stored in the "A" Pool with any Category A or B assembly. In the "B" Pool it must be stored in the peripheral cells of the pool.

C. Plausible since an assembly with this enrichment and burnup can be stored with any Category A or B assembly but not with a Category F assembly.

D. Plausible since an assembly with this enrichment and burnup could be stored in the "A" Pool with any Category A or B assembly. However, in the "B" Pool it must be surrounded by eight empty water cells.

OPS 5-01 Obj. 15; ITS 3.7.15 Figure 1 & 2

RO - New

Reference(s) provided: ITS 3.7.15 and Figures 1 & 2

36. 038EG2.1.28 001/1/1//C/A 4.1/4.1/NEW/R/CR030901/OPS 4-25 OBJ 3

An OTSG tube rupture has occurred coincident with a LOOP. EOP-2, Vital System Status Verification, Immediate Actions have been performed. A Symptom Scan is now in progress.

For these conditions which ONE of the following describes the operation of the main steam radiation monitors?

A. RM-G26 and RM-G27, main steam line radiation monitors, can be used to measure gamma radiation levels in the steam flowing to the condenser.

B. RM-G26 and RM-G27, main steam line radiation monitors, can be used to approximate tube leak rate.

C.✔ RM-G25 and RM-G28, main steam line release monitors, can be used to measure gamma radiation levels in the steam flowing to atmosphere.

D. RM-G25 and RM-G28, main steam line release monitors, can be used to approximate tube leak rate.

038EG2.1.28 - Knowledge of the purpose and function of major system components and controls. (OTSG Tube Rupture)

Reasons:

A. Plausible since the distractor is correct when the reactor is at power. These monitors are designed to detect high energy gamma radiation (N-16). N-16 gamma production is a direct function of reactor power level. Also, for the current conditions the TBVs will be closed due to the loss of all CWPs so there will be no steam flowing to the condenser.

B. Plausible since the distractor is correct when the reactor is at power.

C. Correct. These detectors monitor all levels of gamma radiation (not power level dependent) and with the current conditions OTSG pressure is being controlled using the ADVs so steam is being released to the atmosphere.

D. Plausible since these detectors monitor all levels of gamma radiation but have no tube leak rate function associated with them.

OPS 4-25 Obj. 3; OPS 4-25 Section 1-4.0.C & D

RO - New

Reference(s) provided: None

37. 039K3.05 001/2/1//MEM 3.6/3.7/BANK/R/CR030901/OPS 3-22 OBJ 3

The reactor has just been taken critical when an atmospheric dump valve (ADV) fails open.

Which ONE of the following describes what will happen to Tave and nuclear power and what operator actions should be taken?

A. Tave will rise; final power will be at the point of adding heat (POAH). The ADV should be closed and rods inserted to restore Tave.

B. Tave will rise; final power will exceed the POAH. The ADV should be closed and secondary parameters used to restore Tave.

C. Tave will lower; final power will be at the POAH. The ADV should be closed and rods withdrawn to restore Tave.

D.✔ Tave will lower; final power will exceed the POAH. The ADV should be closed and secondary parameters used to restore Tave.

039K3.05 - Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: RCS

Reasons:

A. The steam leak will cause RCS temperature to lower; the size of the steam leak should approximate the final power level.

B. The steam leak will cause RCS temperature to lower.

C. The size of the steam leak should approximate the final power level. Rods should not be withdrawn to restore Tave.

D. Correct. Tave will lower and the positive reactivity addition will raise reactor power to approximately the size of the steam leak.

OPS 3-22 Obj. 3; OPS 3-22 Sections 3-2.0.C, 3-4.0.A and 3-5.0.C; AI-505, Enclosure 1

RO - Bank

Reference(s) provided: None

CHAPTER 3
STEAM LEAKS

3-2.0 SYMPTOMS

A. A Steam Leak will cause an overcooling as seen on a P-T diagram. The indication is a trace to the left and below the operating window. Refer to **Figure 4**.

B. A steam leak will indicate a higher primary ΔT; also, a ΔTc will be indicated on the Main Control Board instrumentation.

C. The following could be indicative of a steam leak:

1. The operator may observe the steam leak on the main steam relief monitor.

2. Operators in the plant may hear or see the leak before it causes any plant disturbance.

3. OTSG level/pressure may decrease with no reduction in feedwater to the affected OTSG.

4. **Reactor power will increase proportionately with the size of the steam leak.**

3-3.0 DIAGNOSIS

A. During an overcooling transient, Thot and Tcold will converge as the RCS temperatures trend to a common value following a reactor trip. This is true only as long as the RCS pumps are running.

B. The excessive heat removal by the steam generators will cause the average reactor coolant temperature to go down. As the temperature goes down, the reactor coolant will contract causing the pressurizer level to go down.

C. If the effect cannot be offset by increased makeup flow to the RCS, the pressurizer level will continue to go down, causing the RCS pressure to also go down. If the pressurizer empties, the RCS pressure will decrease toward saturation pressure causing a loss of subcooling margin.

38. 041K6.03 001/2/2//C/A 2.7/2.9/MOD/R/CR030901/OPS 4-09 OBJ 2 & 7

The following plant conditions exist:

- The plant is at 40% power with turbine control in ICS/Auto.
- The main turbine is selected to "A" header pressure for control.

Which ONE of the following describes the plant response if the selected "A" header pressure transmitter failed instantly to mid-scale?

SASS will:

A. swap to the unaffected transmitter. Turbine and TBV control will *not* be affected.

B. swap to the unaffected transmitter. Turbine control will *not* be affected but the TBV associated with the failed transmitter must be controlled in manual.

C. ✔ NOT swap to the unaffected transmitter. Turbine control and control of the TBV associated with the failed transmitter will be affected.

D. NOT swap to the unaffected transmitter. Turbine control will be affected but the TBV associated with the failed transmitter will *not* be affected.

041K6.03 - Knowledge of the effect of a loss or malfunction on the following will have on the Turbine Bypass Valves: Controller and positioners, including ICS, S/G, CRDS

Reasons:

A failure mid-scale of the transmitter will result in a 900# signal. A delta of 15#. SASS requires a 3% scale change to transfer. This equates to 18# of the 600# to 1200# scale. With HP setpoint at its normal value of 47.5 the SASS transfer would not occur.

A. Plausible since all rapid transmitter failures, with the exception of this one, will cause SASS to automatically swap to the unaffected transmitter with no plant control issues.

B. Plausible since all rapid transmitter failures, with the exception of this one, will cause SASS to automatically swap to the unaffected transmitter with no plant control issues. Turbine and TBV control are affected.

C. Correct. Turbine and TBV control will be affected. ICS will lower header pressure and the plant will eventually trip if no actions are taken.

D. Plausible since Turbine control can be selected to different header pressure transmitters and dependent on selection may not be affected at all by this failure.

OPS 4-09 Obj. 2 & 7; OPS 4-09 Figure 25; OP-501 Enclosure 3

RO - Modified

Reference(s) provided: None

39. 054AA1.01 001/1/1//MEM 4.5/4.4/BANK/R/CR030901/OPS 5-14 OBJ 6

The following plant conditions exist:

- A LOOP has occurred with the plant previously at 40% power.
- EFP-2 did not start.
- EFP-3 has a red light on the control handle but no flow is indicated.

Which ONE of the following "prompt and prudent" actions, as described in AI-505, Conduct of Operations During Abnormal and Emergency Events, should be taken?

Attempt to:

A. start EFP-1.

B. start FWP-7.

C. open MSV-55 and/or MSV-56 (EFP-2 steam isolation valves).

D.✔ open ASV-5 and/or ASV-204 (EFP-2 steam control valves).

054AA1.01 - Ability to operate and /or monitor the following as they apply to the Loss of Main Feedwater (MFW): EFW controls, including the use of alternate EFW sources

Reasons:

A. & B. Plausible since these actions would restore emergency feedwater flow to the OTSGs however these actions don't meet the intent of "Prompt and Prudent" per AI-505. Procedural guidance will be provided if EFP-2 cannot be started.

C. Plausible since MSV-55 & 56 are upstream steam isolation valves to EFP-2 however these are normally open valves. There is no automatic closure signal to these valves so in this mode the valves could only be closed using an ECO.

D. Correct. Prompt and prudent actions may be taken for failure of an automatic system to perform or respond correctly. If ASV-5 didn't open automatically then it or its sister valve, ASV-204, should be manually selected to open.

OPS 5-14 Obj. 6; AI-505 Step 4.1.4.1.b; OPS 4-31 Section 1-2.0.D.2.a)

RO - Bank

Reference(s) provided: None

40. 055EK3.02 001/1/1//MEM 4.3/4.6/BANK/R/CR030901/OPS 5-100 OBJ 3

Which ONE of the following describes why selected DC motors must be stopped in EOP-12, Station Blackout?

This is necessary for the 1E batteries to meet their:

A. 2 hour ITS requirement.

B. 4 hour ITS requirement.

C. 2 hour coping requirement.

D.✔ 4 hour coping requirement.

055EK3.02 - Knowledge of the reasons for the following responses as they apply to the Station Blackout: Actions contained in EOP for loss of offsite and onsite power.

Reasons:

A. Plausible since TS 3.8.4 Bases states that each battery has adequate storage capacity to carry the required loads continuously for at least 2 hours.

B. Plausible since four hours is the SBO coping requirement, but not the TS requirement.

C. Plausible since two hours is the TS requirement. The reason for stopping these pumps is to meet the four hour SBO coping requirement.

D. Correct. Per FSAR and EOP-TBD this step is performed to ensure the 1E batteries meet the SBO four hour coping requirements.

OPS 5-100 Obj. 3; EOP-12 Step 3.8; ITS 3.8.4 Bases; OPS 4-64 Obj. 8, Section 1.4.0.A.2; FSAR Section 8.2.2.6 and 14.1.2.9.5.2

RO - Bank (2 distractors completely changed)

Reference(s) provided: None

41. 056AA1.05 001/1/1/0130502003/C/A 3.8/3.9/MOD/R/CR030901/OPS 4-13 OBJ 2

The following plant conditions exist:

- MUP-1A is tagged out.
- EDG-1A is tagged out.
- The reactor was manually tripped due to lowering RCS pressure.
- When the reactor tripped a Loss of Offsite Power occurred.
- As RCS pressure continued to lower, EOP-03, Inadequate SCM, was entered.
- Rule 1, Loss of SCM, has been completed.
- Lowest RCS pressure attained was 750 psig.

Based on the following ES Status Light indications, which ONE of the following describes the status of ES components following completion of Rule 1, Loss of SCM?

"A" Train		"B" Train	
Component	***ES Status Lights***	***Component***	***ES Status Lights***
MUP-1A	OUT	MUP-1B	OUT
MUP-1B	GREEN	MUP-1C	GREEN
MUV-23	AMBER	MUV-25	GREEN
MUV-24	AMBER	MUV-26	GREEN
MUV-586	GREEN	MUV-586	GREEN
MUV-587	GREEN	MUV-587	GREEN
DHP-1A	AMBER	DHP-1B	AMBER

A. ✔ All components have actuated/responded as expected.

B. All "A" Train components have actuated/responded as expected with the exception of MUV-23 and MUV-24.

C. All "B" Train components have actuated/responded as expected with the exception of DHP-1B.

D. All "A" Train components have actuated/responded as expected with the exception of MUP-1B.

056AA1.05 - Ability to operate and / or monitor the following as they apply to the Loss of Offsite Power: Initiation (manual) of safety injection process

Reasons:

A. Correct. For these conditions all components have responded properly.

B. Plausible as the correct choice since MUV-23 & 24 receive a signal to open upon ES actuation and the expectation is for these status lights following ES actuation is for them to be GREEN. Also plausible because there is guidance in EOP-03 to align the backup power supplies for MUV-23 and MUV-24 in order to open the valves prior to verifying acceptable HPI flow.

C. Plausible since DHP-1B would normally receive a start signal resulting from the cascade up from RBIC which is actuated in Rule 1. In this case the DHP will not start because the signal is blocked due to loss of offsite power.

D. Plausible since MUP-1B would receive a start signal upon actuation of ES. The breaker will close resulting in the "GREEN" status light even though the MUP is not running due to the loss of offsite power and EDG-1A being tagged out.

OPS 4-13, Obj. 2; OPS 4-13 Tables 2, 4 & 5; EOP-13, Rule 1

RO - Modified

Reference(s) provided: None

42. 056K1.03 001/2/2//MEM 2.6/2.6/BANK/R/CR030901/OPS 4-69 OBJ 4

Which ONE of the following describes the **direct** signal that lowers condensate flow demand on a loss of one MFWP at 80% power?

A. A signal from the DFT high level interlock.

B. A runback signal from the ULD sub-section of the ICS.

C. A signal that compares existing CD flow with FW flow and HW level.

D. ✔ A signal that compares existing CD flow with FW flow and DFT level.

056K1.03 - Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following system: MFW

Reasons:

A. Plausible since this interlock will trip all running CDPs, not lower CD demand.

B. Plausible since a runback will be in effect however there is no direct signal to condensate to lower demand.

C. Plausible since FW flow and CD flow are compared to modify condensate demand. Hotwell level will rise due to the loss of the MFWP but this will only modify the position of CDV-88 (HW reject valve), not actual CD demand.

D. Correct. CD demand is directly modified by actual FW flow and DFT level.

OPS 4-69 Obj. 4; OPS 4-69 Section 1-4.0.B.5.f

RO - Bank

Reference(s) provided: None

43. 058AK1.01 001/1/1//C/A 2.8/3.1/NEW/R/CR030901/OPS 4-64, OBJ 3,4

The following plant conditions exist:

- Annunciator P-07-09, Battery Ground, alarmed.
- One minute later annunciator P-07-08, Battery Charger Trouble, alarmed and the Battery Ground annunciator cleared.
- Local inspection finds Battery Charger 3A (DPBC-1A) tripped.
- The ground detector for the 3A Battery shows no indication of a DC ground.

Which ONE of the following describes the possible cause for the above conditions and the action necessary to prevent a loss of DC power?

___(1)___ caused Battery Charger 3A (DPBC-1A) to trip. Place Battery Charger
___(2)___ in service IAW OP-705, Emergency Power-DC System.

A. ✔ (1) A battery charger internal fault
(2) 3E (DPBC-1E)

B. (1) A ground on the ES MCC AC supply breaker to the battery charger
(2) 3E (DPBC-1E)

C. (1) A battery charger internal fault
(2) 3F (DPBC-1F)

D. (1) A ground on the ES MCC AC supply breaker to the battery charger
(2) 3F (DPBC-1F)

058AK1.01 - Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: Battery charger equipment and instrumentation

Reasons:

A. Correct. Since now there is no indication of a DC ground the fault must have been internal to the battery charger. DPBC-1E is the swing charger for the "A" DC bus.

B. Plausible since second part of distractor is correct. In addition a ground on the supply breaker to the battery charger could cause the charger to trip but would not cause a Battery Ground alarm.

C. Plausible since the first part of the distractor is correct. DPBC-1F is the swing charger for the "B" DC bus.

D. Plausible since a ground on the supply breaker to the battery charger could cause the charger to trip but would not cause a Battery Ground alarm. DPBC-1F is the swing charger for the "B" DC bus.

OPS 4-64 Obj. 3 & 4; AR-701 EP 1576 & 1582; OP-705 Enclosure 1

RO - New

Reference(s) provided: None

44. 059A3.04 001/2/1//C/A 2.5/2.6/NEW/R/CR030901/OPS 4-68 OBJ 3,4,7

The following plant conditions exist:

- The plant was at 85% power when RCP-1D tripped.
- The plant has stabilized following the runback.

Which ONE of the following describes the status of the "B" FW main block valve and the "B" MFW pump Bailey control station indication?

The "B" FW main block valve is __(1)__ . Selecting "Meas Var" on the "B" MFW pump Bailey control station should indicate __(2)__.

A. (1) open
(2) 50

B. (1) closed
(2) 50

C. (1) open
(2) 80

D. ✔ (1) closed
(2) 80

059A3.04 - Ability to monitor automatic operation of the MFW, including: Turbine driven feed pump

Reasons:

Due to the loss of RCP-1D the plant will automatically runback to 75% power and stabilize. FW will re-ratio with FW demand on the "B" Train lowering and closing the "B" FW main block valve. Once the block valve reaches its closed seat the "B" MFW pump will switch to dP control with a setpoint of 80 psig. With the block valve open selecting "Meas Var" should indicate 50 (no error). With the block valve closed selecting "Meas Var" should indicate 80 (delta P).

A. Plausible since this is the correct block valve positions and indications for normal plant operation at 75% power with all RCPs running.

B. Plausible since first part of distractor is correct. Also this is the correct indication for normal plant operation at 75% power with all RCPs running.

C. Plausible since this is the correct block valve position for 75% power with all RCPs running. Second part of distractor is correct.

D. Correct. See above explanation.

OPS 4-68 Obj. 3, 4 & 7; OPS 4-14 Obj. 4; OPS 4-68 Section 1-7.0.E; OPS 4-14 Sections 1-7.0.C.3)b) and 1-15.0 Table 3

RO - New

Reference(s) provided: None

45. 059K3.02 001/2/1//C/A 3.6/3.7/NEW/R/CR030901/OPS 4-68 OBJ 3,4,7

With the plant at 55% power which ONE of the following sets of conditions will cause an Emergency Feedwater (EFW) actuation?

FWP-1A/B	Main FW Booster pumps
FWP-2A/B	Main FW Turbine driven pumps

__(1)__ trips concurrent with __(2)__ .

A. (1) FWP-1A
(2) FWP-2A tripping

B. ✔ (1) FWP-1A
(2) FWV-2 (FWP-1B suction valve) stroking 10% from full open

C. (1) FWP-2A
(2) FWV-8 (FWP-1B discharge valve) stroking 90% from full open

D. (1) FWP-2A
(2) High - High Deaerator level

059K3.02 - Knowledge of the effect that a loss or malfunction of the MFW will have on the following: EFW system

Reasons:

A. Plausible since both a main FW pump and booster are tripped but the plant can run with only one of each. A runback will occur and reduce power to 50%.

B. Correct. FW Booster pump suction valves are interlocked to trip their associated pump if they leave their open seat. This condition will cause a loss of both FW Booster pumps which will in turn trip all running MFWPs. Loss of all MFWPs with the RPS not in shutdown bypass will actuate EFIC.

C. Plausible because FWV-8 has an interlock that requires it to be closed prior to starting FWP-1B.

D. Plausible since both Booster pumps have a trip based on DFT level, just not high-high level. Both Condensate pumps trip on high-high level.

OPS 4-68 Obj. 3, 4 & 7; OPS 4-31 Obj. 2; OPS 4-68 Sections 1-4.0.C.6.c) and 1-4.0.K.7; OPS 4-31 Section 1-2.0.C

RO - New

Reference(s) provided: None

46. 061AG2.1.12 001/1/2//C/A 3.7/4.1/NEW/R/CR030901/OPS 4-25 OBJ 6

A channel functional test is being performed on RM-G6 (Makeup Tank Area radiation monitor) IAW SP-335A, Radiation Monitoring Instrumentation Functional Test RMGs. The "As Found" meter reading is normal.

After holding the "Alarm Reset-Operate-Check Source" switch to the "CHECK SOURCE" position for one (1) minute there was no response observed on the RMG meter.

Which ONE of the following could cause the response observed above and based on these results what is the next action directed by SP-335A to be taken for RM-G6?

A. Minor drift of detector high voltage.

Direct HP personnel to expose detector to a wand.

B. ✔ High background radiation.

Direct HP personnel to expose detector to a wand.

C. Minor drift of detector high voltage.

Declare RMG channel inoperable and submit work request for repair.

D. High background radiation.

Declare RMG channel inoperable and submit work request for repair.

061AG2.2.12 - Knowledge of surveillance procedures. (ARM System)

Reasons:

A. Plausible since detector high voltage drift can effect meter response. However, RM-G6 is a Geiger Mueller detector and minor changes in detector high voltage would not have a significant affect on indication. Major changes to detector voltage would cause the meter to read low or zero however the stem states that the "As Found" indication appeared normal. If the background radiation is high relative to the source strength the procedure provides guidance to have HP expose the detector to a wand.

B. Correct. High background radiation can mask the response of a detector to it's check source. SP-335A, Step 4.6.8, provides direction to have HP personnel expose the detector to a wand if the normal check source test fails to get a meter response.

C. Plausible since detector high voltage drift can effect meter response. However, RM-G6 is a Geiger Mueller detector and minor changes in detector high voltage would not have a significant affect on indication. Major changes to detector voltage would cause the meter to read low or zero however the stem states that the "As Found" indication appeared normal. If the background radiation is high relative to the source strength the procedure provides guidance to have HP expose the detector to a wand. It is not until after the detector has been checked with the wand that an operability assessment of the RMG is directed (Section 5.2).

D. Plausible since the RMG may be inoperable however the procedure provides guidance to have HP expose the detector to a wand. It is not until after the detector has been checked with the wand that an operability assessment of the RMG is directed (Section 5.2).

OPS 4-25, Obj. 6; SP-335A Step 4.6.8 and Section 5.2

RO - New

Reference(s) provided: None

47. 061K3.02 001/2/1//C/A 4.2/4.4/MOD/R/CR030901/OPS 4-37 OBJ 3

A maintenance worker inadvertently hits the power supply wiring for EFV-58, EFP-3 to 'A' OTSG control valve, pulling the wire out of the valve body.

Which ONE of the following describes how this will affect the EFW system and the actions required to isolate this line?

If an EFIC actuation were to occur, "A" OTSG ____(1)____ . To isolate this EFW line EFV-14, block valve for EFV-58, should be closed and its power supply de-energized at ____(2)____ .

A. (1) will overfill to 100%
(2) DPDP-8C

B. (1) EFW flow would be excessive
(2) DPDP-8C

C. (1) will overfill to 100%
(2) DPDP-8D

D.✔ (1) EFW flow would be excessive
(2) DPDP-8D

061K3.02 - Knowledge of the effect that a loss or malfunction of the EFW will have on the following: S/G

Reasons:

A. Plausible since EFV-58 fails open on a loss of power. However EFV-14 is still functional and once a high level condition is met (96% OTSG level) this valve will close and stop EFW flow. EFV-14 is powered from DPDP-8D ("B" train power supply), not DPDP-8C.

B. Plausible since (1) is correct. However EFV-14 is powered from DPDP-8D ("B" train power supply), not DPDP-8C.

C. Plausible since EFV-58 fails open on a loss of power. However EFV-14 is still functional and once a high level condition is met (96% OTSG level) this valve will close and stop EFW flow. (2) is correct.

D. Correct. There will be excessive EFW flow due to EFV-58 failing open from the loss of power. EFV-14 is powered from DPDP-8D.

OPS 4-37 Obj. 3; OPS 4-31 Section 1-4.0.E.2; OPS 4-37 Sections 1-4.0.H.2 and 1-4.0.I.8

RO - Modified

Reference(s) provided: None

48. 062A2.16 001/2/1//C/A 2.5/2.9/MOD/R/CR030901/OPS 4-90 OBJ 4

The following plant conditions exist:

- The plant is operating at 100% power when Q-04-02, 4KV ES Bus Degraded Volt Trip, alarm is received.
- Two of the three 'A' ES Bus degraded voltage (SLUR) relays have actuated.

Which ONE of the following describes the status of the 'A' EDG and which Abnormal Procedure should be entered?

The 'A' EDG should:

A. start. AP-730, Grid Instability, should be entered.

B. start. AP-770, Emergency Diesel Generator Actuation, should be entered.

C. ✔ NOT start. AP-730, Grid Instability, should be entered.

D. NOT start. AP-770, Emergency Diesel Generator Actuation, should be entered.

062A2.16 - Ability to (a) predict the impacts of the following malfunctions or operations on the AC distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Degraded system voltages

Reasons:

A. The SLUR relays require 3 out of 3 to cause a diesel start. Plausible since FLUR relays require 2 out of 3 logic. One of the Entry Conditions for AP-730 is ES 4160V bus voltage < 4.15 KV. SLUR relay setpoint is 3952V, so voltage must have dropped at least that low.

B. The SLUR relays require 3 out of 3 to cause a diesel start. Plausible since FLUR relays require 2 out of 3 logic. AP-770 entry requires an ES 4160V bus UV to occur. While a Degraded Voltage condition was in effect nothing in the stem indicates that an Under Voltage condition occurred.

C. Correct. The degraded voltage relays (SLUR) require 3 out of 3 logic to start a diesel. Since only 2 SLUR relays tripped no EDG start should occur. One of the Entry Conditions for AP-730 is ES 4160V bus voltage < 4.15 KV. SLUR relay setpoint is 3952V, so voltage must have dropped at least that low.

D. The degraded voltage relays (SLUR) require 3 out of 3 logic to start a diesel. Since only 2 SLUR relays tripped no EDG start should occur. While a Degraded Voltage condition was in effect nothing in the stem indicates that an Under Voltage condition occurred so entry into AP-770 is not required.

OPS 4-90, Obj. 4; OPS 5-30, Obj. 2; OPS 5-126, Obj. 2; OPS 4-90 Section 1-4.0.O.3.b; AP-730 Step 1.0; AP-770 Step 1.0; AR-702 EP 1747

SRO - Modified SRO question to RO level (2007 NRC)

Reference(s) provided: None

49. 063A3.01 001/2/1//MEM 2.7/3.1/NEW/R/CR030901/OPS 4-64 OBJ 3

The "Bus A1 125V DC Available" light on the MCB 'Standby Power Status' section has extinguished.

Which ONE of the following describes the reason why this light has extinguished?

A. DC Bus A1 discharge current is > 75 amps

B. "A" Battery Charger voltage is > 140 VDC

C. ✔ DC Bus A1 voltage is < 72 VDC

D. "A" Battery Charger voltage is < 124 VDC

063A3.01 - Ability to monitor automatic operation of the dc electrical system, including: Meters, annunciators, dials, recorders, and indicating lights

Reasons:

A. Plausible since this high discharge current will cause annunciator window P-06-06 to alarm.

B. Plausible since this high voltage will cause annunciator window P-07-08 to alarm.

C. Correct. When individual battery voltage lowers to < 72 VDC this light will extinguish.

D. Plausible since this low voltage will cause annunciator window P-07-08 to alarm.

OPS 4-64 Obj 3; OPS 4-64 Section 1-4.0.A.8.b; AR-701 EP #'s 1576, 1938 & 1944

RO - New

Reference(s) provided: None

50. 064G2.4.45 001/2/1//C/A 4.1/4.3/NEW/R/CR030901/OPS 4-06 OBJ 7 & 8

The following plant conditions exist:

- Window B-08-03, Diesel Gen A Out of Service, has annunciated due to the total loss of DPDP-6A.
- Event Point 1206, "A" EDG Starting Air Pressure Low, is in alarm.

Based on the loss of DPDP-6A Event Point 1206 is an __(1)__ alarm for this failure. The "A" EDG is __(2)__ and __(3)__.

A. ✔
(1) expected
(2) running
(3) can ONLY be stopped locally

B.
(1) expected
(2) running
(3) can be stopped from the MCB

C.
(1) UN-expected
(2) NOT running
(3) investigation for the cause of low air pressure should be commenced

D.
(1) UN-expected
(2) NOT running
(3) consideration should be given to cross connecting the diesel start air systems by opening EGV-25 and EGV-26

064G2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm. (Emergency Diesel Generator)

Reasons:

DPDP-6A supplies all DC power to the "A" EDG. On a loss of all DC power the EDG will start. When the EDG starts the starting air pressure lowers below 225 psig which triggers the low starting air pressure alarm and is therefore an expected alarm. Due to the loss of all DC power the only way to stop the EDG is by locally tripping the fuel racks.

A. Correct. See above explanation.

B. Plausible since this is an expected alarm and the EDG will be running, however all control will be lost from the MCB.

C. Plausible since a loss of DC power does not normally cause low air pressure alarms. Also EP 1206 'Operator Action' for this alarm is to investigate the cause of the low air pressure.

D. Plausible since a loss of DC power does not normally cause low air pressure alarms. Also EP 1206 'Discussion' for this alarm is to consider cross connecting the diesel start air systems by opening EGV-25 and EGV-26.

OPS 4-06 Obj. 7 & 8; AR-302 EP 1195 and 1206

RO - New

Reference(s) provided: None

51. 064K4.01 001/2/1//C/A 3.8/4.1/NEW/R/CR030901/OPS 4-06 OBJ 4

The diesel is powering the ES bus while separated from the grid.

While loading the diesel which ONE of the following describes a condition that will trip the diesel *engine*?

A. An excitation malfunction resulted in a -5.5 mVAR signal to the EDG.

B. An excitation malfunction resulted in a +5.5 mVAR signal to the EDG.

C. A governor malfunction resulted in lowering speed to 795 rpm.

D.✔ A governor malfunction resulted in raising speed to 1005 rpm.

064K4.01 - Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following: Trips while loading the ED/G (frequency, voltage, speed)

Reasons:

A. & B. Plausible since there is a voltz/hertz trip on the main generator, but not on the EDG. Also since these values are much higher/lower than normal running values it is plausible that the engine will trip. Required values for normal operation are $\pm$ 1.5 mVARS.

C. Plausible since there is a voltz/hertz trip on the main generator, but not on the EDG.

D. Correct. There is a mechanical overspeed trip setpoint at 990 rpm.

OPS 4-06 Obj. 4

RO - New

Reference(s) provided: None

52. 065AG2.4.8 001/1/1//C/A 3.8/4.5/NEW/R/CR030901/OPS 5-100 OBJ 4

The following plant conditions exist:

- The plant was operating at 100% RTP.
- IAP-4 is removed from service for overhaul.
- The "A" EDG is removed from service for maintenance.
- A weather related event has caused a loss of ALL offsite power.
- A fire in the "B" ES 4160V switchgear room prevents the "B" ES Diesel from energizing "B" ES 4160V bus.

Which ONE of the following describes the procedure(s) that is/are *initially* performed?

A. EOP-12, Station Blackout, ONLY

B. EOP-12 and AP-470, Loss of Instrument Air, ONLY

C. ✔ EOP-12 and AP-880, Fire Protection, ONLY

D. EOP-12, AP-470 and AP-880

065AG2.4.8 - Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (Loss of Instrument Air)

Reasons:

A. Plausible since EOP-12 is normally a stand alone procedure (per NOTE prior to Step 3.1) with the exception of AP-880.

B. Plausible because without IAP-4, and no power to the remaining instrument air compressors, the entry conditions would be met for AP-470, Loss of Instrument Air. The mitigation strategy for EOP-12 relies on the backup air bottles for up to 30 minutes to allow time for the operators to align the ADVs to their associated backup air. Otherwise the mitigation strategy does not require the instrument air system to be functioning. The note at step 3.1 of EOP-12 states that with the exception of AP-880, no other event procedures or rules are to be performed unless specifically directed by EOP-12 or the TSC.

C. Correct. The note at step 3.1 of EOP-12 states that with the exception of AP-880, no other event procedures or rules are to be performed unless specifically directed by EOP-12 or the TSC.

D. Plausible since the entry conditions for AP-470 are met but per the Note prior to Step 3.1 only AP-880 will be entered without TSC or procedure direction.

OPS 5-100, Obj. 4; EOP-12 Page 3

RO - New

Reference(s) provided: None

53. 068K4.01 001/2/2//MEM 3.4/4.1/NEW/R/CR030901/OPS 4-25 OBJ 4 & 7

With the plant in Mode 1 which ONE of the following describes the operation of the RM-L2/L7 Valve/Pump Interlock Bypass key switch?

When selected to ___(1)___ a liquid release to the environment through ___(2)___ is available ___(3)___.

A.
(1) Normal
(2) RM-L7
(3) without starting additional RWPs

B. ✔
(1) Normal
(2) RM-L2
(3) without starting additional RWPs

C.
(1) Bypass
(2) RM-L7
(3) ONLY if RWP-3A or 3B is started

D.
(1) Bypass
(2) RM-L2
(3) ONLY if RWP-2A or 2B is started

068K4.01 - Knowledge of design feature(s) and/or interlock(s) which provide for the following: Safety and environmental precautions for handling hot, acidic, and radioactive liquids

Reasons:

A. Plausible since this would be the correct answer if this were RM-L2, not RM-L7. Would also be correct if the plant were in Mode 5 or 6 with either DH train in operation.

B. Correct. With the bypass key switch selected to Normal WDV-892 is interlocked with RWP-1, 2A or 2B. While in Mode 1 at one of these pumps are always running.

C. Plausible since this describes the operation of RM-L7 if the key switch was selected to Normal.

D. Plausible since this describes the operation of RM-L2 if the key switch was selected to Normal.

OPS 4-25 Obj. 4 & 7; OPS 4-25 Sections 1-4.0.G.9 and 1-8.0.A; OP-403 EP 2044

RO - New

Reference(s) provided: None

54. 073A4.03 001/2/1//MEM 3.1/3.2/BANK/R/CR030901/OPS 4-25 OBJ 3 & 4

Which ONE of the following represents the effect of depressing the "CHECK SOURCE" button on RM-L2 and the reason for having a check source?

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

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

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

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

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

073A4.03 - Ability to manually operate and/or monitor in the control room: Check source for operability demonstration

Reasons:

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

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

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

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

OPS 4-25, Obj. 3 & 4; OPS 4-25 Section 1-4.0.G. & 1-7.0.C.

RO - Bank (NRC 2007)

Reference(s) provided: None

55. 074EA2.03 001/1/2/1190402001/C/A 3.8/4.1/BANK/R/CR030901/OPS 5-97, OBJ 4

The following plant conditions exist:

- A LOCA occurred when the plant was tripped for a fire in the Turbine Bldg.
- To assist fighting the fire the Unit 6900/4160V buses have been de-energized.
- The only available High Pressure Injection (HPI) pump tripped.
- EFP-3 is the only available EFW/AFW pump.
- EOP-7, Inadequate Core Cooling, has been entered based superheat conditions indicated on SPDS.
- Ten minutes later Tincore is 700° F and RCS pressure is 500 psig.

EOP-07, Step 3.13 states the following:

3.13 ___ Establish and maintain OTSGs as a heat sink.	___ Maintain OTSG PRESS using TBVs (preferred) or ADVs to establish primary to secondary $\Delta T \approx 100°F$. See Figure 2

Which ONE of the following describes the action necessary to establish and maintain OTSGs as a heat sink? **(reference provided)**

A. Lower OTSG pressure to 160 psig using the Turbine Bypass valves (TBVs).

B. Lower OTSG pressure to 200 psig using the Turbine Bypass valves (TBVs).

C. ✓ Lower OTSG pressure to 160 psig using the Atmospheric Dump valves (ADVs).

D. Lower OTSG pressure to 200 psig using the Atmospheric Dump valves (ADVs).

074EA2.03 - Ability to determine or interpret the following as they apply to a Inadequate Core Cooling: Availability of turbine bypass valves for cooldown

Plausibility of distracters: Caution in EOP-07: Maintain OTSG pressure $\geq$ 200 psig if EFP-2 is running.

Reasons:

A. OTSG pressure should be lowered to 120 psig. TBVs will not open with no condenser vacuum.

B. TBVs will not open with no condenser vacuum.

C. OTSG pressure should be lowered to 120 psig. TBVs will not open with no condenser vacuum.

D. Correct. The ADVs would have to be used with no condenser vacuum. OTSG pressure should be lowered to 120 psig.

OPS 5-97, OBJ 4

SRO - Bank

Reference(s) provided: EOP-07, Figure 2

56. 076G2.4.8 001/2/1//C/A 3.8/4.5/NEW/R/CR030901/OPS 5-14 OBJ 3

The following plant conditions exist:

- The plant was at 100% power when a loss of ALL offsite power occurs.
- EDG-1B fails to start.

After completion of the Symptom Scan in EOP-2, Vital System Status Verification, which ONE of the following describes the additional procedure(s) that is (are) applicable and should be in use IAW AI-505, Conduct of Operations During Abnormal and Emergency Events?

A. ✔ ONLY AP-770, Emergency Diesel Generator Actuation, will be applicable and should be concurrently performed.

B. AP-770, Emergency Diesel Generator Actuation, AND AP-330, Loss of Nuclear Service Cooling, will be applicable and should be concurrently performed.

C. ONLY AP-770, Emergency Diesel Generator Actuation, will be applicable but shall NOT be concurrently performed until directed by EOP-2.

D. AP-770, Emergency Diesel Generator Actuation, AND AP-330, Loss of Nuclear Service Cooling, will be applicable but shall NOT be concurrently performed until directed by EOP-2.

076G2.4.8 - Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (Service Water System)

Reasons:

EDG-1A will still be powering the "A" bus following a LOOP. RWP-2A has no low pressure auto-start so there will be no SW RW flow. RWP-1 (normal duty pump) is lost due to the LOOP. Entry Conditions for AP-330 require the loss of SW/RW flow WITH the inability to restore. The operator should use the guidance in AP-770 or take "prompt and prudent" actions to manually start RWP-2A. Entry into AP-330 is not applicable.

A. Correct. AP-770 should be entered due to the undervoltage condition of the "A" ES 4160V bus and meets the AI-505 conditions for concurrent EOP/AP use.

B. Plausible since AP-770 should be entered; however the entry conditions for AP-330 are not met because SW/RW flow can be restored.

C. Plausible since only AP-770 should be entered. EOP-2, Step 3.15 directs concurrent performance of AP-770 but, per AI-505, AP-770 should be concurrently performed as soon as an operator is available.

D. Plausible since AP-770 should be entered; however the entry conditions for AP-330 are not met because SW/RW flow can be restored. Also EOP-2, Step 3.15 directs concurrent performance of AP-770 but, per AI-505, AP-770 should be concurrently performed as soon as an operator is available.

OPS 5-14, Obj. 3; AI-505, Section 4.1.2; AP-770 & AP-330 Entry Conditions

RO - New

Reference(s) provided: None

57. 077AK2.03 001/1/1//C/A 3.0/3.1/NEW/R/CR030901/OPS 2-16 OBJ 44

The following plant conditions exist:

- CR-3 is operating at 100% RTP.
- The electrical grid is at near record load with minimal reserve capacity.
- CR-5 has tripped due to a failed boiler tube.
- CR-3 remains on line.

Which ONE of the following identifies the response of CR-3's main generator operating parameters IMMEDIATELY following the loss of CR-5?

(Disregard any affects caused by System Load Control functions.)

A. MWe - rise
Hz - rise
MVAR out - rise

B. ✔ MWe - rise
Hz - lower
MVAR out - rise

C. MWe - lower
Hz - lower
MVAR out - rise

D. MWe -rise
Hz - rise
MVAR out - lower

077AK2.03 – Knowledge of the interrelations between Generator Voltage and Electric Grid disturbances and the following: Sensors, detectors, indicators.

Reasons:

Assuming no automatic response from System Load control functions the immediate response of the CR3 main generator to the loss of CR5 would be as follows:

MWE would rise due to the existing load on the grid being shared with the remainder of the plants still on line.

Hz (frequency) would lower as the increased load was picked up by CR3's main generator due to the rise in energy demanded for the existing equilibrium energy being produced by the generator which will slow it down.

MVAR out would rise due to the existing reactive load on the grid being shared with the remaining plants still on line.

A. Plausible since 2/3 of the main generator parameters are correct for the given conditions based on the discussion above.

B. Correct. Based on the discussion above.

C. Plausible since 2/3 of the main generator parameters are correct for the given conditions based on the discussion above.

D. Plausible since 2/3 of the main generator parameters are correct for the given conditions based on the discussion above.

OPS-2-16, Obj. 44; OPS 2-16 Section 1-7.0.R

RO - New

Reference(s) provided: None

58. 078K1.04 001/2/1//MEM 2.6/2.9/BANK/R/CR030901/OPS 4-81 OBJ 2 & 3

Which ONE of the following automatic actions would be expected on a total loss of Secondary Services Closed Cycle Cooling (SC)?

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

B. FWP-2A will trip on high motor air temperature at 180° F.

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

D. ✔ IAP-3A will trip on high 2nd stage air temperature at 130° F.

078K1.04 - Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: Cooling water to compressor

Reasons:

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

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

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

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

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

RO - Bank (2007 NRC)

Reference(s) provided: None

59. 103A2.03 001/2/1//C/A 3.5/3.8/NEW/R/CR030901/OPS 5-85 OBJ 1

The following plant conditions exist:

- A LOCA is in progress
- RCS pressure is 1085 psig
- RCS temperature is 554° F
- No automatic ES actuations have occurred

Following the Symptom Scan which ONE of the following procedures must be entered and what actions will be taken? **(reference provided)**

A. ✔ EOP-3, Inadequate Subcooling Margin

Manually actuate HPI and RBIC

B. EOP-3, Inadequate Subcooling Margin

Manually actuate HPI and Diverse Containment Isolation

C. EOP-4, Inadequate Heat Transfer

Manually actuate HPI and RBIC

D. EOP-4, Inadequate Heat Transfer

Manually actuate HPI and Diverse Containment Isolation

103A2.03 - Ability to (a) predict the impacts of the following malfunctions or operations on the reactor building system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Phase A and B isolation

Reasons:

A. Correct. Using steam tables the operator will determine that the sat temperature for 1100 psig is 556° F. While the RCS is not saturated operators should know that adequate SCM does not exist. Actions per EOP-3 are required.

B. Plausible since EOP-3 entry is required. A manual HPI does not close the valves associated with Diverse Containment Isolation, however actuation of RBIC will close all the valves associated with DCI plus perform additional functions.

C. Plausible since using steam tables the operator will determine that the RCS is not saturated and may not enter EOP-3 based on that reasoning.

D. Plausible since using steam tables the operator will determine that the RCS is not saturated and may not enter EOP-3 based on that reasoning. With an inadequate SCM condition manual actuation of HPI and RBIC is required.

OPS 5-85, Obj. 1; Steam Tables

RO - New

Reference(s) provided: Steam Tables, EOP-03: Figures 1&2

60. 103K1.01 001/2/1//MEM 3.6/3.9/BANK/R/CR030901/OPS 4-62 OBJ 5

Which ONE of the following describes the basis for the Limit and Precaution for minimum RB pressure during the performance of SP-340B, DHP-1A, BSP-1A and Valve Surveillance?

A. This establishes the conditions necessary for RB spray flow control valve (BSV-3/4) stroke time determination for operability.

B. This establishes the conditions necessary for BSP-1A pump differential pressure measurement so that a repeatable test can be performed.

C. ✔ This prevents exceeding the negative design pressure of the RB if an accidental discharge of the RB spray system were to occur.

D. This ensures the minimum 40 psig pressure drop across the spray nozzles if an accidental discharge of the RB spray system were to occur.

103K1.01 - Knowledge of the physical connections and/or cause-effect relationships between the reactor building system and the following systems: CCS

Reasons:

A. Plausible since ΔP across a valve can affect stroke time however when stroking this particular valve the BS pump is not running.

B. Plausible since baseline conditions must be met to ensure test repeatability.

C. Correct. This is the stated reason as found in SP-340B, L & P 3.5.4. Plant specific OE related to this activity.

D. Plausible since this is the design number for ΔP across the spray nozzles but this value is only tested during refueling outages, not the quarterly surveillance.

OPS 4-62, Obj. 5; SP-340B, Step 3.5.4

RO - Bank (one distractor changed for plausibility)

Reference(s) provided: None

61. BW/A02AG2.2.12 001/GENERIC///C/A 3.7/4.1/NEW/R/CR030901/OPS 4-09 OBJ 2

The following plant conditions exist:

- The plant is in Mode 4.
- PM-161, NNI Power Supply/AC Auto Transfer Check and Alarm Verification, is in progress.
- Switch S1 (VBDP-5 input to NNI-X DC power supply) has been opened.
- Prior to re-closing switch S1 VBDP-1 loses power.

Based on the conditions above which ONE of the following describes the status of NNI-X power?

A. ONLY AC power is lost

B. ONLY DC power is lost

C. BOTH AC *and* DC power are lost

D. NEITHER AC *nor* DC power is lost

BW/A02AG2.2.12 - Knowledge of surveillance procedures. (Loss of NNI-X/Y)

Reasons:

VBDP-1 and 5 supply power for NNI-X AC and DC power. VBDP-5 is an inverter backed power supply. VBDP-1 is not inverter backed and is powered from a non-safety bus. Loss of the Startup transformer in this mode will result in the loss of VBDP-1.

A. Plausible since this would be the correct answer if VBDP-5, breaker 7, instead of Switch S1, was opened in the stem of the question.

B. Correct. With Switch S1 opened one NNI-X DC power supply is de-energized. The loss of VBDP-1 de-energized the other DC power supply resulting in a loss of all NNI-X DC power.

C. Plausible since DC power is lost and both NNI-X AC and DC power is supplied from the same VBDPs.

D. Plausible if the candidate thinks that VBDP-1 is inverter backed like VBDP-5. Answer also would be correct if the OPT developed the fault instead of the Startup xfmr.

OPS 4-09, Obj. 2; OPS 4-09 Power Supply figure; OPS 4-91 Section 1-3.0.C and Figure 1

RO - New

Reference(s) provided: None

62. BW/A06AK1.3 001/1/2//C/A 3.4/3.4/BANK/R/CR030901/OPS 4-09 OBJ 4

The following plant conditions exist:

- The plant is in Mode 3 with RCS pressure at 2150 psig.
- AP-990, Shutdown from Outside the Control Room, has been entered and transfer to the Remote Shutdown Panel is complete.
- The CRS directs that PZR level be maintained at an *indicated* ≈ 100 inches.

Which ONE of the following actions should be taken and what would be the approximate *actual* PZR level for these conditions?

A. Locally control MUV-31; ≈ 160 inches.

B. Use an available HPI valve; ≈ 160 inches.

C. Locally control MUV-31; ≈ 40 inches.

D. Use an available HPI valve; ≈ 40 inches.

BW/A06AK1.3 - Knowledge of the operational implications of the following concepts as they apply to the (Shutdown Outside Control Room): Annunciators and conditions indicating signals, and remedial actions associated with the (Shutdown Outside Control Room).

Reasons:

A. Per step 3.54 an available HPI valve should be used.

B. Correct. HPI valves can be controlled from the RSP. PZR level indication on the RSP is not temperature compensated. Actual level for this pressure and temperature is approximately 60" higher than indicated.

C. Per step 3.54 an available HPI valve should be used. Actual level for these conditions should be ≈ 160 inches.

D. Actual level for these conditions should be ≈ 160 inches.

OPS 4-09 Obj. 4; AP-990 Step 3.54; OPS 4-16 Section 1-7.A.1.f

RO - Bank

References provided: None

63. BW/A07AK2.1 001/1/2//MEM 3.7/3.5/BANK/R/CR030901/OPS 5-127 OBJ 5

Which ONE of the following describes the *specific* concern that AP-1040, Aux Building Flooding, is designed to address?

A. Loss of access to the Aux Building.

B. Potential for unmonitored release.

C. ✔ Loss of ES MCC powered equipment.

D. Processing large amounts of waste water.

BW/A07AK2.1 - Knowledge of the interrelations between the (Flooding) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Reasons:

A. Plausible since normal access to the Aux building is from the 95' elevation of the Turbine building. Any flooding in the Aux building or Turbine building could potentially affect access. AP-1040 does provide guidance for an alternate Aux building access point but it is not the primary purpose of the procedure.

B. Plausible since flooding in the Aux building could allow a significant volume of contaminated water to escape through the doors at the HP control point to the Turbine building. This effluent could potentially find its way to the environment via non-radioactive systems in the Turbine building.

C. Correct. The Probablistic Risk Assessment (PRA) identified the potential for significantly increased risk resulting from a water level in the Aux building high enough to cause damage that would render the 480V ES MCCs on the 95' elevation unavailable. Important safety related equipment powered by these MCCs and assumed in the risk model could become unavailable following a failure that causes significant flooding in the Aux building.

D. Plausible since there would most certainly be a need for waste water processing if an event occured resulting in flooding of the Aux building. AP-1040 does provide guidance for the control of significant volumes of waste water but it is not the primary purpose of the procedure.

OPS-5-127, Obj. 5; OPS 5-127 Section 1-1.0

RO - Bank

Reference(s) provided: None

65. BW/EO8EA1.1 001/1/2//MEM 4.0/3.7/MOD/R/CR030901/OPS 5-95 OBJ 3

A step in EOP-8A, LOCA Cooldown, states:

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

Which ONE of the following describes the reason for this step per the EOP-8A EOP Cross-Step Document (ECD) and what indication would be expected to ensure AHF-1A is operating in low speed?

SW temperatures could exceed design limits if the RB Fan Coolers were in a __(1)__ condition. AHF-1A % load meter is indicating approximately __(2)__.

A. (1) clean, non-degraded
(2) 0%

B. (1) fouled, degraded
(2) 0%

C.✔ (1) clean, non-degraded
(2) 45%

D. (1) fouled, degraded
(2) 45%

BW/E08EA1.1 - Ability to operate and / or monitor the following as they apply to the (LOCA Cooldown): Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Reasons:

A. Plausible since the first part of the answer is correct. With the coolers in a non-degraded condition the improved heat transfer rate could cause the SW temperature to increase above the design limit. The % load meter for AHF-1A indicates 0% current when the fan is running in fast speed.

B. Plausible since a fouled, degraded cooler is normally a bad condition but in this case, since SW temperature is the concern, a degraded cooler results in a lower SW temperature. The % load meter for AHF-1A indicates 0% current when the fan is running in fast speed.

C. Correct. With the coolers in a non-degraded condition the improved heat transfer rate could cause the SW temperature to increase above the design limit. The % load meter for AHF-1A indicates some % of current when the fan is running in low speed only. Magnitude of current depends on the density of the air in the RB.

D. Plausible since a fouled, degraded cooler is normally a bad condition but in this case, since SW temperature is the concern, a degraded cooler results in a lower SW temperature.

OPS 5-95 Obj. 3; EOP-TBD Cross Step Document for EOP-8A; OPS 4-63 Obj. 2.0-3; OPS 4-63 Section 2-4.0.B.h

RO - Modified

Reference(s) provided: None

66. G2.1.3 001/GENERIC///MEM 3.7/3.9/NEW/R/CR030901/OPS 5-38 OBJ 3

The plant is at 100% power. The CRS, OAC and BOP are the only licensed operators in the control room. The OAC needs to step out of the control room to make a personal phone call. Per AI-500, Conduct of Operations, which ONE of the following describes the requirements for this activity?

The OAC:

A. must be relieved by a licensed operator other than the current BOP or CRS.

B. ✔ may be relieved by the current BOP.

C. must remain in the Red Carpet Area at all times unless formally relieved by another licensed operator.

D. may leave the control room, with CRS permission, for up to 10 minutes without being relieved.

G2.1.3 - Knowledge of shift or short-term relief turnover practices.

Reasons:

A. Plausible since AI-500 normal operating crews have 2 ROs in the main control room during all operating modes. However there are allowances for 1 RO to be outside of the MCR for short periods of time.

B. Correct. The current BOP may formally relieve the OAC for short periods of time.

C. Plausible since the expectation is that the OAC will always remain in the Red Carpet Area however an exception is outlined in AI-500, Appendix 3, Step 3.2 that allows the OAC to leave the Red Carpet Area as long as he remains in view of the control board to perform required functions.

D. Plausible since the 10 minute time frame is applicable to the STAs.

OPS 5-38 Obj. 3, 6 & 13; OPS 5-38, Step 3.2.6 and Appendix 3, Section 3.0

RO - New

Reference(s) provided: None

67. G2.1.36 001/GENERIC///C/A 3.0/4.1/BANK/R/CR030901/OPS 5-50 OBJ 1

Refueling is in progress with eight (8) fuel assemblies in the core. As the ninth assembly is being placed in the core the following NI readings are observed:

- NI-1 rises from a base count of 203 to 430 cps.
- NI-2 rises from a base count of 240 to 390 cps.

Which ONE of the following actions, if any, should be taken for these conditions?

A. No action is required. This is an expected NI response for initial core reloading.

B. Once the assembly is placed in the core contact reactor engineering to perform a Co/Ci calculation.

C. Cease insertion of the fuel assembly, contact reactor engineering and obtain a boron analysis.

D. ✔ Withdraw the fuel assembly, stop any other core alterations in progress, perform Co/Ci calculations and obtain a boron analysis.

G2.1.36 - Knowledge of procedures and limitations involved in core alterations.

Reasons:

A. Plausible since a rise in count rate is expected, just not of this magnitude. Since count rate increased by more than 1.5 times then the required actions are to withdraw the fuel assembly in question, immediately cease all other core alterations, perform a Co/Ci calculation and obtain a boron analysis of the RCS.

B. Plausible since most emergency actions during refueling are to place a fuel assembly in the core or nearest upender.

C. Plausible since only one doubling in count rate has occurred and until reactor engineering is contacted this may be considered a normal rise in count rate.

D. Correct. Per FP-203 the fuel assembly should be removed, core alterations suspended, an engineering evaluation performed and a boron analysis obtained.

OPS 5-50 Obj. 1; FP-203 Step 3.2.1.1.1 (Limit and Precaution)

RO - Bank

Reference(s) provided: None

68. G2.1.40 001/GENERIC///MEM 2.8/3.9/MOD/R/CR030901/OPS 5-50 OBJ 1

The following plant conditions exist:

- The plant is in "No Mode" condition with the reactor defueled.
- Preparations are being made to reload the core.
- Main Fuel Handling Bridge (FHCR-1) testing is in progress when a limit switch failure prevents testing from being completed.
- The control room has been informed that initial troubleshooting is in progress.
- The troubleshooting team desires to operate TS-3, Bridge Interlock bypass, in order to move the bridge to repair the limit switch.

Which ONE of the following describes the approval and concurrence, if any, required for this action in accordance with FP-601A, Operation of Main Fuel Handling Bridge FHCR-1?

A. The Shift Manager must approve. NO concurrence is required.

B. The Shift Manager must approve with concurrence of Reactor Engineering.

C. ✔ The Refueling Supervisor must approve. NO concurrence is required.

D. The Refueling Supervisor must approve with concurrence of Reactor Engineering.

G2.1.40 - Knowledge of refueling administrative requirements.

Reasons:

A. SM approval is not required per FP-601A.

B. SM approval is not required per FP-601A. Reactor Engineering is required to be involved in fuel moves but not in troubleshooting of the equipment doing the moves.

C. Correct. Per FP-601A the Refueling Supervisor (SRO) must approve bypassing any interlocks unless specifically directed by procedure.

D. Reactor Engineering concurrence is not required per FP-601A.

OPS 5-50 Obj 1; FP-601A Step 3.2.1 (Limit and Precaution)

RO - Modified (Harris 2009A NRC SRO question)

Reference(s) provided: None

69. G2.2.20 001/GENERIC//1190101031/MEM 2.6/3.8/BANK/R/CR030901/OPS 5-38 OBJ 21

After performance of a surveillance procedure on the "A" EDG the diesel is determined to be inoperable.

Which ONE of the following actions should be taken IAW AI-500, Conduct of Operations Department Organization and Administration, to ensure troubleshooting activities will not render the redundant train inoperable?

A. Fill out a cross train work authorization form.

B. Assign one individual to be the single point of accountability for the duration of the repairs.

C. ✔ Verify protected train signs are posted and conduct a field walkdown of the appropriate opposite train equipment.

D. Post a dedicated operator at the doors to the "B" ES 4160V switchgear room so that only personnel approved by the Shift Manager will have access.

G2.2.20 - Knowledge of the process for managing troubleshooting activities.

Reasons:

A. Cross train authorization does not apply.

B. Three (3) individuals will be appointed for single point accountability, one for each shift.

C. Correct. Protected train signs will be placed on the "B" Train equipment and a field walkdown should be performed.

D. No immediate response is required therefore no dedicated operator is required.

AI-500 Form Appendix 7-07; Task # 1190101025

RO - Bank (SRO objectives only)

Reference(s) provided: None

70. G2.2.38 001/GENERIC/5-01 8//MEM 3.6/4.5/BANK/R/CR030901/OPS 5-01 OBJ 8

Which ONE of the following describes the equipment required to meet the Limiting Condition of Operation (LCO) for ITS 3.4.14, RCS Leakage Detection Instrumentation?

A. RB sump level, wide range and RM-A6 iodine channel

B. RB sump level, wide range and RM-A6 particulate channel

C. RB sump level, narrow range and RM-A6 iodine channel

D. ✔ RB sump level, narrow range and RM-A6 particulate channel

G2.2.38 - Knowledge of conditions and limitations in the facility license.

Reasons:

ITS 3.4.14 requires following RCS leakage detection instrumentation:
One containment sump monitor (narrow range) and one containment atmosphere radioactivity monitor (gaseous or particulate).

A. Plausible since RB sump level and RM-A6 are both required per TS 3.4.14, RCS Leakage Detection Instrumentation.

B. Plausible since second part of distractor is correct. RB sump level, narrow range is required.

C. Plausible since first part of distractor is correct. RM-A6 particulate channel is required per TS 3.4.14, RCS Leakage Detection Instrumentation.

D. Correct. Per TS 3.4.14 RB sump narrow range level is required and either RM-A6 gas or particulate channel is also required.

TS 3.4.14 and 3.4.14 Bases

RO - Bank

Reference(s) provided: None

71. G2.3.11 001/GENERIC///MEM 3.8/4.3/MOD/R/CR030901/OPS 5-01 OBJ 8

The plant is at power when chemistry reports that RCS Specific Activity has exceeded ITS limits. The Shift Manager has ordered a plant shutdown.

Which ONE of the following is a TS limit designed to limit the release of radioactivity in the event of a tube rupture?

A. ✔ Establish Mode 3 with RCS Tave < 500° F.

B. Lower reactor power to ≤ 12% prior to tripping the turbine.

C. Lower RCS Tave to < 565° F prior to tripping the reactor.

D. Establish Mode 3 and place all condensate demins in service.

2.3.11 Ability to control radiation releases.

Reasons:

A. Correct. TS 3.4.15 is only applicable above 500° F.

B. Plausible since this is Step 3.20 of EOP-6, Steam Generator Tube Rupture.

C. Plausible since this is Step 3.24 of EOP-6, Steam Generator Tube Rupture.

D. Plausible since this is a logical action and will actually lower the activity of the condensate due to the tube leak.

OPS 5-01 Obj. 8; TS 3.4.15 and Bases

RO - Modified (Watts Bar 2004 NRC Exam)

Reference(s) provided: None

72. G2.3.12 001/GENERIC///MEM 3.2/3.7/BANK/R/CR030901/OPS 5-43 OBJ 5

The following plant conditions exist:

- A Refueling Outage is in progress.
- You have been assigned a task in the RCA and have signed on to the Operations RWP.
- When approaching the area where the task is to be performed you note that the area is fenced and conspicuously posted with a flashing red light.

Which ONE of the following describes the classification of this area and the MINIMUM approval authority needed for entry?

	Area Classification	Individual Approving Entry
A.	Very High Radiation Area	Shift Outage Director
B.	Very High Radiation Area	Supervisor Radiation Control
C.	Locked High Radiation Area	Shift Outage Director
D.✔	Locked High Radiation Area	Supervisor Radiation Control

G2.3.12 - Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, **access to locked high-radiation areas**, aligning filters, etc.

Reasons:

A. A VHRA is barricaded, and conspicuously posted but use of a flashing red light is not allowed. It must be locked. The Plant General Manager must be notified of entry into a VHRA, and depending on how high the dose rate is may have to approve entry, but this is a LHRA and the Supervisor Radiation Control is authorized to approve entry.

B. A VHRA is barricaded, and conspicuously posted but use of a flashing red light is not allowed. It must be locked. The Plant General Manager must be notified of entry into a VHRA, and depending on how high the dose rate is may have to approve entry, but this is a LHRA and the Supervisor Radiation Control is authorized to approve entry.

C. A LHRA may be conspicuously posted by the use of a flashing red light IAW Tech Spec 5.8.3 and RSP-101, Step 4.10.1 vice locked if it is not feasible to lock it. The Plant General Manager or Shift Outage Director is not required to approve entry into a LHRA.

D. Correct. A LHRA may be conspicuously posted by the use of a flashing red light IAW Tech Spec 5.8.3 and RSP-101, Step 4.10.1 vice locked if it is not feasible to lock it. This is a LHRA and the Supervisor Radiation Control is authorized to approve entry.

OPS 5-43 Obj 5; ITS 5.8.3; RSP-101 Steps 4.10.1, 4.10.3 and 4.11.1

RO - Bank (Harris-2009A NRC RO question)

Reference(s) provided: None

73. G2.3.14 001/GENERIC///C/A 3.4/3.8/NEW/R/CR030901/OPS 5-101 OBJ 1

The following plant conditions exist:

- The plant is operating at 100% RTP.
- RB pressure, temperature and sump level are normal.
- PZR level is stable.
- MUT level is lowering at approximately 5 gpm.
- RM-A12, Condenser Vacuum Pump Exhaust Gas Radiation Monitor, is rising.

Which ONE of the following describes the event procedure that is applicable and a potential location for *significant* elevated radiation levels?

A. AP-510, Rapid Power Reduction; the affected condensate and feedwater heaters.

B. EOP-06, Steam Generator Tube Rupture; the affected condensate and feedwater heaters.

C. AP-510, Rapid Power Reduction; the condensate demineralizers.

D. ✔ EOP-06, Steam Generator Tube Rupture; the condensate demineralizers.

G2.3.14 - Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.

A. Plausible based on the conditions given in the stem. RCS leakage is greater than the ITS limit which would require an unscheduled plant shutdown. AP-510, Rapid Power Reduction, would normally be used for excessive RCS leakage conditions, but not for a SGTR. Condensate and feedwater heaters are plausible but not correct.

B. Plausible based on meeting the entry conditions for EOP-06, Steam Generator Tube Rupture. Condensate and feedwater heaters are plausible but not correct.

C. Plausible based on the conditions given in the stem. RCS leakage is greater than the ITS limit which would require an unscheduled plant shutdown. AP-510, Rapid Power Reduction, would normally be used for excessive RCS leakage conditions, but not for a SGTR. Second part of distractor is correct.

D. Correct. The entry conditions for EOP-06, Steam Generator Tube Rupture are met based on the given plant conditions.

OPS-5-101, Obj. 1; OPS-4-25, Obj. 2; EOP-06 Entry Conditions; OP-601 Step 3.2.10; OPS 4-72, Section 1-7.0.13.b

RO - New

Reference(s) provided: None

74. G2.4.35 001/GENERIC//1190402001/MEM 3.8/4.0/BANK/R/CR030901/OPS 5-31 OBJ 6

AP-990, Shutdown from Outside the Control Room, has been entered.

After control has been transferred to the RSP a followup step directs the RO to ensure BSP-1A is tripped by opening the DC knife switch and depressing the manual trip pushbutton.

Which ONE of the following describes where this action is performed and its purpose?

A. ✔ The "A" ES 4160V switchgear room; to protect the pump from loss of essential support functions.

B. The "A" ES 480V switchgear room; to protect the pump from loss of essential support functions.

C. The "A" ES 4160V switchgear room; to ensure the pump cannot auto-start because automatic control of the pumps discharge control valves is defeated.

D. The "A" ES 480V switchgear room; to ensure the pump cannot auto-start because automatic control of the pumps discharge control valves is defeated.

G2.4.35 - Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.

Reasons:

A. Correct. The breaker is located in the "A" ES 4160V switchgear room and due to possible fire damage to the ES actuation circuits this action will ensure the pump cannot start.

B. This BSP is 4160V powered, not 480V.

C. Plausible since this action will prevent starting of the pump and, depending on where the fire actually is, may disable automatic control of the pump's discharge valve.

D. This BSP is 4160V powered, not 480V. Plausible since this action will prevent starting of the pump and, depending on where the fire actually is, may disable automatic control of the pump's discharge valve.

OPS 5-31, Obj 6; OPS 5-31 Section 1-4.0.W; AP-990 Step 3.23

RO - Bank

Reference(s) provided: None

75. G2.4.8 001/GENERIC///MEM 3.8/4.5/NEW/R/CR030901/OPS 5-14 OBJ 3
Which ONE of the following choices completes the statement below?

IAW AI-505, Conduct of Operations During Abnormal and Emergency Events, if an Abnormal Procedure (AP) Entry Condition is met during the performance of an Emergency Operating Procedure (EOP) the ____(1)____ will direct ____(2)____ .

A. ✔ (1) Procedure Director
(2) concurrent performance of the AP by an available operator

B. (1) Shift Manager
(2) concurrent performance of the AP by an available operator

C. (1) Procedure Director
(2) performance of the AP after major actions of the controlling EOP have been completed

D. (1) Shift Manager
(2) performance of the AP after major actions of the controlling EOP have been completed

G2.4.8 - Knowledge of how abnormal operating procedures are used in conjunction with EOPs.

Reasons:

A. Correct. AI-505 states, among other requirements, that the Procedure Director determines operator availability to perform the APs, and directs the CONTROL BOARD OPERATORS to concurrently perform the actions of APs while an EOP is in progress.

B. Plausible in that the Shift Manager has overall "command and control" of the crew and may direct the Procedure Director to perform an applicable AP but based on AI-505, the Procedure Director is responsible for providing the direction to the available operator to perform the AP concurrently with the controlling EOP.

C. Plausible since the Procedure Director determines operator availability to perform the APs, and directs the CONTROL BOARD OPERATOR to concurrently perform the actions of APs while an EOP is in progress. However, there is no requirement to wait on completion of any major EOP actions before performing applicable APs.

D. Plausible in that the Shift Manager has overall "command and control" of the crew and may direct the Procedure Director to perform an applicable AP but based on AI-505, the Procedure Director is responsible for providing the direction to the available operator to perform the AP concurrently with the controlling EOP. There is no requirement to wait on completion of any major EOP actions before performing applicable APs.

OPS 5-14, Obj. 3; AI-505 Step 4.1.2

RO - New

Reference(s) provided: None