Cover Page NRC Draft Rev. 13

1. 001 AK2.06 4

Given the following plant conditions:

- The unit is operating at 88% power
- Reactor power is RISING
- Tavg is greater than Tref
- Pressurizer level is RISING

Which ONE of the following would cause the above symptoms to occur?

A. Turbine Load Rejection

B. Uncontrolled rod withdrawal

C. Failed OPEN S/G Safety valve

D. Power Range channel N-43 fails high

*Justification:*

*A. Incorrect. Load rejection would justify Tave > Tref and power decrease not increase or PRT.*

*B. Correct. Continuous rod withdrawal would cause reactor power to increase, Tave to increase, RCS pressure increase due to pressurizer level increase (RCS less dense). Pressure increase could cause PORV to open.*

*C. Incorrect. RCS pressure would decrease, Tavg would decrease*

*D. Incorrect. Rod withdrawal blocked by C-2 (1/4 >103%). Therefore, none of the operating parameters should change. NI failing high would drive rods in*

**K/A Statement: Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: T-ave./ref. deviation meter (CFR 41.7 / 45.7)**

Technical Reference(s): OFN SF-011, LO1732421

Proposed references to be provided to applicants during examination: None

Learning Objective: R3/R4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 001 AK1.03 | [3.9/4.0] | {41.8, 41.10} |
| | 001 AA2.05 | [4.4/4.6] | {43.5} |

Est Time: 4 min

Incorporated Boyle comments. Changed to Rev. 4, 6/18/11

Answer: B

2. 002 K4.01 5
While draining the Reactor Coolant System to mid-loop for nozzle dam removal, wide range level indications BB LI-53A indicates 65" and BB LI-54A indicates 85".

What should the Control Room Operator now do?

A. Continue the drain-down until the NR loop level indicators are on scale and then resolve level discrepancy.

B. Stop the drain-down and use the tygon hose to resolve the level discrepancy and determine the actual level.

C. Continue the drain-down maintaining a difference in readings of less than 15" until the NR loop level indicators are on scale.

D. Stop the drain-down and verify level by comparing NR level indicators BB LI-53B & BB LI-54B to PZR cold cal level indicator BB LI-462.

*Justification:*

*A. Incorrect, will stop at any point during draindown if anomoly is found, incorrect to continue with discrepancy*
*B. Correct. Acceptable difference on wide range indicators is 10 inches or 3" by NPIS. Step 4.1, 4.2, 4.5.8, Attachment B*
*C. Incorrect, 15" is greater than 10", incorrect to continue with discrepancy*
*D. Incorrect, cold cal 462 is not listed as another indicator to use, discrepancy is verified against tygon hose level.*

**K/A Statement: Knowledge of RCS design feature(s) and/or interlock(s) which provide for the following: Filling and draining the RCS (CFR: 41.7)**

Technical Reference(s): GEN 00-008, LO1732108

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _12354______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Changed to Rev. 5 6/18/11, incorporated Boyle comments

Answer: B

3. 003 A4.05 4
With the plant at full power normal operation, which ONE of the following describes where RCP #1 seal leakoff flow is directed?

A. VCT

B. PRT

C. RCDT

D. Containment

*Justification*

*A. Correct.*
*B. Incorrect, Seal return relief discharges to the PRT, normally aligned to the VCT*
*C. Incorrect, #2 & 3 discharges to the RCDT*
*D. Incorrect, #3 seal put some leakoff to Containment*

*#1 is displayed on recorders*

**K/A Statement: Ability to manually operate and/or monitor in the control room: RCP seal leakage detection instrumentation (CFR: 41.7 / 45.5 to 45.8)**

Technical Reference(s): SY1300300, M-12BB03, M-12BG01, M-12BG03

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Incorporated Brendan comments. Changed to Rev. 4 6/3/11

Answer: A

4. 003 AA2.02 5
Given the following plant conditions:

- The unit is at 100% power all systems normal
- 080C, RPI ROD DEV, alarm LIT
- 081B, ROD AT BOTTOM, alarm LIT
- 082F, BANK D FULL OUT ROD STOP, alarm LIT
- DRPI for rod D4 indicates "0" steps
- The RO places rod control in MANUAL
- NPIS indications for Reactor Power are as follows:

  N41 - 100.1%
  N42 - 103.3%
  N43 - 100.1%
  N44 - 94.7%

Which ONE of the following interlocks or protective features must be cleared before automatic rod withdrawal is reinstated?

A. NIS power range overpower rod withdrawal rod stop.

B. Rod control system non-urgent failure alarm.

C. Overpower Delta T turbine runback and auto rod withdrawal rod stop.

D. Power range channel deviation alarm.

*Justification:*

*A. Correct. C-2 PR High Flux Rod Stop > 103% on 1/4 PRM (Blocks Auto and Manual Rod Withdrawal)*
*B. Incorrect, not required to move rods, non-urgent does not impair rod control*
*C. Incorrect, has an input but will not get 2/4 especially for dropped rod*
*D. Incorrect, alarm doesn't block rod movement (NPIS generated alarm)*

**K/A Statement: Ability to determine and interpret the following as they apply to the Dropped Control Rod: Signal inputs to rod control system (CFR: 43.5 / 45.13)**

Technical Reference(s): OFN SF-011, SY1301200, M-744-00026, M-744-00021

Proposed references to be provided to applicants during examination: None

Learning Objective: R4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _____

55.43 __5__

Comments:

Other K/A {CFR}: 003 AK3.04 (3.8-4.1) [41.5,41.10]

Incorporated Boyle comments, changed to Rev. 5, 6/18/11

Answer: A

5. 003 K2.01 4

Given the following plant conditions:

- The unit is at 40% RTP
- PA02 bus trips out on an 86 Lockout

Which ONE of the following describes the plant response?

A. Reactor trips due to the loss of flow from RCP C and RCP D.

B. Control Rods insert due to both Control Rod Drive M/G Sets losing power.

C. NE02 D/G starts and connects to the NB02 due to UV on Bus.

D. Letdown isolates due to loss of power to PK02.

*Justification:*

*A. Correct. 2/4 on flow logic for a reactor trip under 35% RTP*

*B. Incorrect. Only one RDMG set loses power. The other RDMG would keep power to rods if RPS logic not met. PG 19 & 20*

*C. Incorrect. S/U Transformer feeds NB02 stub bus (NB02 should still be energized on a loss of PA02).*

*D. Incorrect. Letdown isolation valves powered from DC. DC bus would not lose power, but would lose charger*

**K/A Statement: Knowledge of bus power supplies to the following: RCPS (CFR: 41.7)**

Technical Reference(s): SYS BB-201, SY1300300, E-11PA02, ALR 00-015A, KD-7496, E-11PK01

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 062 K1.04 | [3.7/4.2] | {41.7} |
| | 003 K2.01 | [3.1/3.1] | {41.7} |
| | 012 A3.06 | [3.7/3.7] | {41.7} |
| | 012 K4.04 | [3.2/3.5] | {41.7} |

Est Time: 3 min

Incorporated Brendan comments, changed to Rev. 4 6/3/11

Answer: A

6. 004 K3.07 2

Given the following plant conditions:

- Reactor was operating at 100% RTP
- BB LS-459D, PZR LEV CTRL SEL, is selected to L459/L460
- A fault occurred on NN01 causing the bus to trip
- The Reactor tripped subsequent to the bus trip

With NO Operator action, which ONE of the following describes the expected PZR level trends following this event?

A. PZR level will increase initially, and then stabilize until the operating crew begins a cooldown of the RCS via steam dumps.

B. PZR level will increase initially, and then decrease until power is restored to NN01.

C. PZR level will decrease initially, and then increase until the operating crew begins a cooldown of the RCS via steam dumps.

D. PZR level will decrease initially, and then increase until power is restored to NN01.

*Justification:*

*A. Incorrect. PZR level would initially lower due to RCS cooldown. Then, PZR level would be expected to rise based on the loss of letdown and maximum charging flow until instrument power is restored.*

*B. Incorrect. PZR level would initially lower due to RCS cooldown. Then, PZR level would be expected to rise based on the loss of letdown and maximum charging flow until instrument power is restored.*

*C. Incorrect. PZR level would initially lower due to RCS cooldown. Then, PZR level would be expected to rise based on the loss of letdown and maximum charging flow until instrument power is restored.*

*D. Correct. PZR level would initially lower due to RCS cooldown. Then, PZR level would be expected to rise since Letdown isolated due to the loss of instrument power and cannot be reestablished until restored. Charging has swapped to the RWST at maximum rate due to control channel power failure. PZR level will be rising, and will continue to rise until bus power is restored.*

**K/A Statement: Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: PZR level and pressure (CFR: 41.7/45/6)**

Technical Reference(s): LO1732431, SY1301000, M-12BB02, OFN NN-021

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New ___X____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A {CFR}: | 004 K1.01 | (3.6/4.0) | {41.3, 5, 7} |
| | 004 K3.02 | (3.7/4.1) | {41.7} |
| | 004 K3.05 | [3.8/4.2] | {41.7} |
| | 004 K4.04 | (3.2/3.1) | {41.7} |
| | 011 K1.01 | [3.6/3.9] | {41.3, 5, 7} |
| | 011 K6.08 | [2.1/2.4] | {41.7} |
| | 057 AA2.16 | (3.0/3.1) | {43.5} |

Est. Time: 3 min.

Incorporated Lee/Jane comments. Replaced K/A due to overlap. Changed to Rev. 2, 6/9/11

Answer: D

7. 005 A4.01 5
Given the following plant conditions:

- Unit is at 100% power
- During a surveillance test on RHR Pump B, the following control switch indications are observed after the pump is started:

- Red Light - OFF / Green Light - ON / Amber Light - ON

Locally at the breaker:

- Red light - OFF / Green Light – ON / White Light – ON / Blue Light - OFF

- Annunciator 00-050A, RHR Pump Trouble, is in alarm

Which ONE of the following describes the status of RHR Pump B?

A. Tripped on overcurrent

B. Tripped on bus differential

C. Not running, with loss of control power

D. Not running, with the local start available

*Justification*

*A. Correct. Pump is not running and blue light OFF indicates the pump trip is caused by an over current relay at the pump breaker.*
*B. Incorrect, This is not a bus electrical trip -- Blue light OFF indicates a 186 instantaneous overcurrent lockout on the breaker not the bus.*
*C. Incorrect, CR and Local breaker indication: pump is not running. Control power is available at the breaker.*
*D. Incorrect, Although the pump has a local start at the breaker, the breaker will not close with a 186 relay actuated*

*ALR 00-050A, RHR PUMP TROUBLE*
*2.0 SYMPTOMS OR ENTRY CONDITIONS*

*2.1 When the annunciator is in the alarm state, it will reflash should any other initiating condition occur.*

*2.2 This procedure is entered when any of the following occurs:*

* *RHR Pump A motor current greater than 100 amps*
* *RHR Pump A trip on overcurrent*
* *RHR Pump B motor current greater than 100 amps*
* *RHR Pump B trip on overcurrent*

*2.3 The following is a list of the instrumentation:*
*o Relay 151/X, Time Overcurrent Relay*
*o Relay 186/M, Instantaneous Overcurrent Lockout Relay*

**K/A Statement: Ability to manually operate and/or monitor in the control room: Controls and indication for RHR pumps (CFR: 41.7 / 45.5 to 45.8)**

Technical Reference(s): SY1300500, E-13EJ01, ALR 00-050A, STS EJ-100B

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _46737______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___2008 DCPP_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _____
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 5, 7/6/11

Answer: A

8. 005 AK3.01 5

Given the following plant conditions:

- A reactor trip without SI has occurred
- The Operators are implementing EMG E-0, REACTOR TRIP OR SAFETY INJECTION
- A check of rod position indications shows that one control rod has not fully inserted
- The Operators continue with the procedure without taking action concerning the stuck rod

Given the conditions above, why is Emergency Boration **NOT** required while performing the Immediate Actions of EMG E-0?

A. Emergency boration will be required after the transition to EMG ES-02, REACTOR TRIP RESPONSE.

B. Maintaining adequate shutdown margin is ONLY a concern following a reactor trip with RCS temperature less than 551°F and decreasing.

C. Emergency boration will be required when the crew transitions to EMG FR-S2, RESPONSE TO LOSS OF CORE SHUTDOWN.

D. Verifying that the remaining rods are fully inserted ensures adequate Shutdown Margin is present.

*Justification*

*A. Incorrect, only one rod stuck, rods checked in ES-02*
*B. Incorrect, SDM is always a concern with stuck rods. 551 is the Min. Temp for Criticality*
*C. Incorrect, SDM is assured with only 1 stuck rod incorrect transition based on plant conditions*
*D. Correct, SDM is assumed to have the most reactive rod out*

**K/A Statement: Knowledge of the reasons for the following responses as they apply to the Inoperable / Stuck Control Rod: Boration and emergency boration in the event of a stuck rod during trip or normal evolutions (CFR 41.5,41.10 / 45.6 / 45.13)**

Technical Reference(s): BD-EMG E-0, EMG E-0, BD-EMG ES-02, ES-02, LO1732315, USAR 4.3.1.5

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:

55.41 _5, 10_
55.43 _____

Comments:

Other K/A: 007 EK3.01 4.0/4.6

Incorporated Boyle comments, changed to Rev. 5, 6/18/11

Answer: D

9. 005 K2.03 4

Which ONE of the following is the power supply to BB PV-8702B, RHR Suction from Loop 4 HL?

A. NG01B

B. NG02B

C. NG03C

D. NG04C

*Justification:*

*A. Incorrect, see below*
*B. Correct.*
*C. Incorrect, see below*
*D. Incorrect, see below*

*BB PV-8702A (NG02B) and EJ HV-8701A (NG01B), RCS Hot Leg 1*
*BB PV-8702B (NG02B) and EJ HV-8701B (NG01B), RCS Hot Leg 4*

*NG03C Auxiliary Building Ventilation Loads*
*NG04C Auxiliary Building Space Heater Loads*

*The electrical power supplies for the RHR pumps are as follows:*

- *NB01 RHR pump 'A', (Breaker NB0101).*
- *NB02 RHR pump 'B', (Breaker NB0204).*

**K/A Statement: Knowledge of bus power supplies to the following: RCS pressure boundary motor-operated valves (CFR: 41.7)**

Technical Reference(s): SY1300500, M-12BB01, E-13BB12B, CKL BB-110

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Est. Time: 2 min

Incorporated Brendan comments, changed to Rev. 4, 6/9/11

Answer: B

10. 006 K3.01 4
Given the following plant conditions:

- Recovery from a Large Break LOCA is in progress

Which ONE of the following components will have the GREATEST impact on LONG TERM core cooling?

Loss of . . .

A. Safety Injection Pumps.

B. Reactor Coolant Pumps.

C. Centrifugal Charging Pumps.

D. Residual Heat Removal Pumps.

*Justification:*

*A. Incorrect. SIPs have ~600 gpm/pump flow. RHR has more capacity.*

*B. Incorrect. RCPs would be OFF due to low pressure. If used due to FR-C1, they could provide some cooling by increasing vapor flow through tube side of S/G. Radiant to conduction to convective heating less efficient than convective heating from RHR liquid flow.*

*C. Incorrect. CCPs have ~3-400 gpm/pump flow. RHR has more capacity.*

*D. Correct. 3800 gpm/pump, suction realigned to CTMT Recirc Sump on RWST LOLO level (long term)*

**K/A Statement: Knowledge of the effect that a loss or malfunction of the ECCS will have on the following: RCS (CFR: 41.7 / 45.6)**

Technical Reference(s): USAR 6.3, 15.6.5, EMG Executive Volume, SY1300500, SY1300600

Proposed references to be provided to applicants during examination: None

Learning Objective: R1, R3, R5

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Other K/A: 006 K6.13 [2.6/2.9] {41.7}

Est Time: 3 min

Incorporated Boyle comments, changed to Rev. 4, 6/18/11

Answer: D

11. 007 2.1.32 3

Which ONE of the following is the reason for maintaining a nitrogen blanket on the Pressurizer Relief Tank (PRT)?

A. To limit the peak pressure of the PRT to 100 psig following a design basis discharge to the tank.

B. To minimize the possibility of forming an explosive mixture of hydrogen and oxygen in the PRT.

C. To ensure NPSH when circulating water from the PRT through the Reactor Coolant Drain Tank HX.

D. To reduce the amount of hydrogen released to Containment if overpressure causes rupture of the rupture disks.

*Justification*

*A. Incorrect, rupture disk basis, N2 is non-condensible, does not improve margin*
*B. Correct. The cover gas prevents air in-leakage and minimizes formation of explosive hydrogen-oxygen content, and isolates (HV-8026 & 8027) on a Containment Isolation Signal Phase A (CIS-A).*
*C. Incorrect, level basis, N2 does not improve NPSH due to dissolved gas*
*D. Incorrect, PRT not a major source of Hydrogen, although it will be a source if rupture disk breached, N2 does not reduce amount*

**K/A Statement: Ability to explain and apply system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)**

Technical Reference(s): SY1300200, M-12BB02, SYS BB-202 (4.4, 4.4.1, 4.4.2)

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 _10___
55.43 __2___

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 007 2.1.28 | [3.2/3.3] | {41.7} |
| | 007 K1.04 | [2.1/2.3] | {41.3} |

Est Time: 2 min

Incorporated Brendan comments, changed to Rev. 3, 6/6/11

Answer: B

12. 007 A2.01 6
Given the following plant conditions:

- The plant was at 100% power
- The reactor is tripped but the Pressurizer Safety Valve has not reseated properly
- Pressurizer Relief Tank (PRT) pressure is 30 psig, rising slowly
- PRT temperature is 175°F, rising slowly

Which ONE of the following choices completes the following statement?

PRT pressure will . . . .

A. continue to rise until rupture disk fails. Vent the PRT to Waste Gas to reduce pressure then cool the PRT by filling and draining the PRT.

B. continue to rise until rupture disk fails. Vent the PRT to Waste Gas to reduce pressure then cool the PRT using the RCDT Heat Exchanger.

C. level off below the rupture disk failure value. Manually initiate Reactor Makeup Water as desired to lower pressure and verify the RCDT Pump(s) maintains PRT level in the desired band.

D. level off below the rupture disk failure value. Manually initiate Reactor Makeup Water as desired to lower pressure and open PRT Drain to Containment Sump Valve BB HIS-8037A to control PRT level.

*Justification:*

*A. Incorrect. Fill and drain is not used unless Waste Gas and RCD Subsystems are not available.*

*B. Correct. Pressure will rise unless the safety valve reseats. When cooling the PRT using the RCDT Heat Exchanger, do not allow RCDT pressure to exceed 50 psig. Exceeding 50 psig will overpressurize the Reactor Coolant Drain Subsystem. Pressure has to lowered first then cool the PRT. If annunciator 00-034D, PRT TEMP HI is received, the contents of the PRT should be cooled by recirculating the tank through the Reactor Coolant Drain Tank (RCDT) Heat Exchanger.*

*C. Incorrect. A leaking Safety valve will continue to leak until it reseats, pressure will continue to rise unless action taken. Wrong action to implement.*

*D. Incorrect. A leaking Safety valve will continue to leak until it reseats, pressure will continue to rise unless action taken. Wrong action to implement.*

**K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the PRTS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Stuck-open PORV or code safety (CFR: 41.5 / 43.5 / 45.3 / 45.13)**

Technical Reference(s): ALR 00-034D, ALR 00-034E, M-12BB02, SYS BB-202 (Prec. 4.1 & 4.6, Sec 6.4), SY1301000

Proposed references to be provided to applicants during examination: Steam Tables

Learning Objective: R1/R2/R4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5__
55.43 _____

Comments:

Modified based on Boyle comments. Changed to Rev. 5, 6/18/11

Answer: B

13. 007 EK2.03 5

Given the following plant conditions:

- The reactor tripped from 100% power due to dropped control rods
- ALL PR HI FLUX bistables are LIT
- ALL SG LOLO bistables are LIT on SB069, PARTIAL TRIP STATUS PERMISS/BLOCK PANEL

Which ONE of the following describes the MINIMUM actions required to close and maintain closed reactor trip breakers?

A. Reset 4/4 PR HI FLUX and 3/4 SG LOLO bistables on 4/4 SG.

B. Reset 4/4 PR HI FLUX and 4/4 SG LOLO bistables on 4/4 SG.

C. Reset 3/4 PR HI FLUX and 4/4 SG LOLO bistables on 4/4 SG.

D. Reset 3/4 PR HI FLUX and 3/4 SG LOLO bistables on 4/4 SG.

*Justification:*

*A. Incorrect, would work but is not the minimum.*

*B. Incorrect, would work but is not the minimum.*

*C. Incorrect, would work but is not the minimum.*

*D. Correct. This is the minimum required.*

**K/A Statement: Knowledge of the interrelations between a reactor trip and the following: Reactor trip status panel (CFR 41.7 / 45.7)**

Technical Reference(s): SY1301200 (Table 1), TS Basis 3.3.1, SY1301100, M-744-00019, M-744-00020, M-744-00024, ALR 00-085B, ALR 00-085A

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Modified based on Boyle comments. Changed to Rev. 5, 6/18/11

Answer: D

14. 008 AK2.02 6

Given the following plant conditions:

- The plant is in MODE 3 at normal operating temperature and pressure.
- NORMAL CHRG PMP FLOW CTRL, BG FK-462 is in AUTO, maintaining 27% PZR level.
- The reference (upper) leg tap for Pressurizer level transmitter BB LT-460 breaks off of the Pressurizer, and RCS pressure starts decreasing.

Which ONE of the following describes the INITIAL responses of PZR level instruments BB LI-459 and BB LI-460 to this event?

| | BB LI-459 <u>PZR Level Indication</u> | BB LI-460 <u>PZR Level Indication</u> |
|---|---|---|
| A. | Increasing trend | Off-scale high |
| B. | Decreasing trend | Off-scale low |
| C. | Decreasing trend | Off-scale high |
| D. | Increasing trend | Off-scale low |

*Justification*

*A. Incorrect. BB LI-459 controls charging flow. BB LI-459 sense change in actual level and charging flow increases. BB LI-459 would decrease, BB LI-460 would be off-scale high due to break*

*B. Incorrect, BB LI-459 would decrease, BB LI-460 would be off-scale high due to break*

*C. Correct, based on simulator run and validation BB LI-459 would decrease, BB LI-460 is off-scale high due to break.*

*D. Incorrect, first part incorrect, BB LI-460 would be off-scale high due to break*

*Charging flow can be selected to any channel. BB LT-460 controls only the isolation valve BG LCV-460. Since BB LT-460 has failed high, the valve BG LCV-460 remains open.*

*The PZR level selector switch, BB LS-459, allows 459 or 461 only as the controlling channel.*

*460 goes off-scale high due to break D/P vs level. The tap is 3/4" to condensate pot only the instruments have the flow restrictors. 459 goes down due to 3/4" LOCA > charging pump capacity.*

**K/A Statement: Knowledge of the interrelations between the Pressurizer Vapor Space Accident and the following: Sensors and detectors (CFR 41.7 / 45.7)**

Technical Reference(s): SY1301000; BD-OFN SB-008, Att J; M-12BB02

Proposed references to be provided to applicants during examination: None

Learning Objective: R10/R5

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__

55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 6, 7/2/11

Answer: C

15. 008 K1.02 6
Given the following plant conditions:

- The plant is in MODE 3 with a cooldown in progress
- CCW Train "B" is supplying the service loop
- Annunciator 053D, CCW SRG TK B LEV HILO, alarms
- CCW Surge Tank "B" water level is slowly decreasing
- Diverse indications show the makeup valve is full open and the Aux Watch reports there are no signs of system leakage

Which ONE of the following describes the probable cause of the above conditions?

A. Excessive primary plant cooldown rate.

B. A leak exists in an RCP thermal barrier heat exchanger.

C. A tube leak exists in the seal water return heat exchanger.

D. CCW system pressure too high for AN pumps to overcome.

*Justification:*

*A. Incorrect, CCW not affected by cooldown as much as SW or ESW. RHR not in service in Mode 3*
*B. Incorrect, Pressure would be higher than CCW pressure resulting in inleakage.*
*C. Correct. VCT pressure is < CCW*
*D. Incorrect, Demin Water pumps can overcome pressure of surge tank.*

*Tank is vented, vent only closes on hi rad.*

**K/A Statement: Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: Loads cooled by CCWS (CFR: 41.2 to 41.9 / 45.7 to 45.9)**

Technical Reference(s): ALR 00-053D, OFN EG-004, SY1400800, LO1732414, M-12EG01

Proposed references to be provided to applicants during examination: None

Learning Objective: R2/R4

Question Source: Bank # _18237______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _2, 4, 7, 8_
55.43 _____

Comments:

Modified based on Boyle comments. Changed to Rev. 6, 6/18/11

Other possible bank question is 17893.

Answer: C

16. 009 EK2.03 6
Given the following plant conditions:

- A small break LOCA has occurred
- The condenser is not available to receive steam
- All S/Gs have been determined to be intact
- PZR level indicates zero and RVLIS indicates a bubble in the reactor vessel
- Reactor vessel level is decreasing slowly
- RCS pressure is greater than all S/G pressures
- ECCS is running with 100 gpm flow indicated
- RCPs are secured
- Steam voiding is indicated in the S/G U-tubes

Which ONE of the following describes ALL core cooling mechanisms presently available?

A. Natural circulation cooling removing all heat from core, break flow removing all heat from primary, S/Gs do not contribute due to steam void in U-tubes.

B. Boiling removing heat from core, break flow, and SI removing heat from core, S/Gs do not contribute due to steam void in U-tubes.

C. Boiling removing almost all heat from core, condensation of steam in U-tubes, SI flow and break flow removing heat from primary.

D. Radiative cooling removing almost all heat from core, SI flow condensation of steam in U-tubes, S/G atmospheric valves and break flow removing heat from primary.

*Justification:*

*At this point core is boiling; most heat removed by heat of vaporization, heat is removed by SI injection; break flow and S/Gs (reflux).*

*A. Incorrect. S/Gs do contribute, natural circulation is not primary heat removal*

*B. Incorrect. same as above*

*C. Correct.*

*D. Incorrect. Radiative transport not primary means of heat transfer*

**K/A Statement: Knowledge of the interrelations between the small break LOCA and the following: S/Gs (CFR 41.7 / 45.7)**

Technical Reference(s): ERG FR-C1 Bkgd, TS Basis 3.5.2, USAR 15.6.5, West. MCD Ch. 2, LO1610706

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__

55.43 _____

Comments:

Est Time: 3 min

Modified based on Jane comments. Changed to Rev. 6, 7/2/11

Answer: C

17. 010 K5.01 7

Given the following plant conditions:

- Pressurizer pressure 985 psig
- Pressurizer Relief Tank (PRT) pressure 5 psig
- PRT temperature 90°F

Assume ambient heat losses are negligible and the steam quality in the Pressurizer bubble is 100%. Also assume Pressurizer and PRT conditions do **NOT** change.

Which ONE of the following PORV downstream temperatures and fluid state would be caused by a leaking Pressurizer PORV?

A. 230°F, two phase

B. 230°F, saturated vapor

C. 300°F, superheated vapor

D. 353°F, saturated vapor

*JUSTIFICATION:*

*A. Incorrect. Candidate used saturation temperature for 20 psia.*
*B. Incorrect. Candidate used saturation temperature for 20 psia.*
*C. Correct. Enthalpy for 1000 psia is 1193 btu/lbm. Throttling is an isenthalpic process. Using Mollier diagram, this will give a temperature of 300°F in the superheated region.*
*D. Incorrect. Enthalpy for 1000 psia is 1193 btu/lbm. Throttling is an isenthalpic process. Using Mollier diagram, this will give a temperature of 353°F in the superheated region. This choice is on the oppossite end of the saturation curve.*

**K/A Statement: 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 (CFR: 41.5 / 45.7)**

Technical Reference(s): Mollier Diagram and/or Steam Tables, LO1131121, LO1131115

Proposed references to be provided to applicants during examination: Mollier Diagram and/or Steam Tables

Learning Objective: R20/21

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 008 AK1.01 | (3.2/3.7) | {41.8, 10} |
| | 193003 K1.25 | (3.3/3.4) | {41.14} |

Est. Time: 3 min.

Modified based on Jane comments. Changed to Rev. 7, 7/2/11

Answer: C

18. 011 EA2.04 4

Given the following plant conditions:

- Reactor trip and SI have actuated
- RCS pressure is 300 psig and DECREASING
- PZR level is offscale low
- RCS temperature is 504°F and DECREASING
- Containment pressure is 6 psig and INCREASING slowly
- S/G pressures are 690 psig and DECREASING slowly
- Crew is performing EMG E-0, REACTOR TRIP OR SAFETY INJECTION

Which ONE of the following caused these conditions?

A. PZR Safety Valve failed OPEN

B. Main Feed Line Break inside Containment

C. Cold Leg Break

D. Main Steam Line Break inside Containment

*Justification:*

*A. Incorrect. A failed safety valve would result in Pressurizer level increase. An operator who does not understand the difference between a vapor space LOCA and a LOCA may choose this distractor.*

*B. Incorrect. A main feedline break would result in S/G pressures much lower than the saturation pressure for the RCS temperature of 504°F. An operator who does not understand the difference between a feedline break and a LOCA may choose this distractor. S/G pressure does not come down until the feed line is isolated or the S/G is dry.*

*C. Correct. S/G pressures are at ~ Tsat for RCS temperature. RCS pressure < S/G pressures. Therefore, RCS cooldown is causing S/G pressure decrease, no faulted S/Gs.*

*D. Incorrect. A main steamline break would result in S/G pressures much lower than the saturation pressure for the RCS temperature of 504°F and pressure would decrease rapidly in the faulted S/G. An operator who does not understand the difference between a MSLB and a LOCA may choose this distractor.*

**K/A Statement: Ability to determine or interpret the following as they apply to a Large Break LOCA: Significance of PZR readings (CFR 43.5 / 45.13)**

Technical Reference(s): EMG E-0, Steam Tables, BD-EMG E-0, LO1610500, LO1732313, USAR Chap. 15 Sections 15.6.1, 15.6.5, 15.1.5, 15.2.8

Proposed references to be provided to applicants during examination: None

Learning Objective: R3/4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge __X_

Comprehension or Analysis ____

10 CFR Part 55 Content:

55.41 _____

55.43 __5__

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 011 EA2.13 | [3.7/3.7] | {43.5} |
| | 002 K1.11 | [4.1/4.2] | [41.2, 4, 5, 7} |
| | 002 K3.03 | [4.2/4.6] | {41.7} |
| | 002 K5.11 | [4.0/4.2] | {41.5} |

Est. Time: 3 min.

Incorporated Brendan comments, changed to Rev. 4, 6/9/11

Answer: C

19. 011 K6.04 5
Given the following plant conditions:

- Unit is at 100% power
- All control systems are in automatic
- Pressurizer Level Control Selector Switch, BB LS-459D, is in the L459/L460 position
- Pressurizer Level Channel II, BB LT-460, fails LOW

Which ONE of the following lists ALL plant responses due to the failures with no Operator actions?

A.
- Letdown isolates
- Pressurizer level increases
- All Pressurizer Heaters shut off

B.
- No effect on charging flow
- No Letdown Isolation
- Pressurizer Backup Heaters shut off

C.
- Charging flow to maximum
- No Letdown Isolation
- Pressurizer Backup Heaters shut off

D.
- Charging flow to maximum
- Letdown Isolates
- All Pressurizer Heaters shut off

*Justification*

*A. Correct.*
*B. Incorrect, charging flow decreases, letdown isolates*
*C. Incorrect, letdown isolates*
*D. Incorrect, all heaters turn off, charging will decrease.*

*BB LI-460 is not the controlling channel.  Ran on simulator Level increases, Ltdn isolates, B/U htrs turn off*

**K/A Statement:  Knowledge of the effect of a loss or malfunction on the following will have on the PZR LCS:  Operation of PZR level controllers  (CFR: 41.7 / 45.7)**

Technical Reference(s): SY1301000, BD-OFN SB-008, ALR 00-032D, E-13BB24, E-13BB22, M-12BB02, M-744-00028, M-744-00029

Proposed references to be provided to applicants during examination:   None

Learning Objective: R5/R10

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__
55.43 _____

Comments:

Other K/A:

011 K2.03 (2.4 - 2.5)
011 K4.02 (3.3 - 3.4)
011 K4.04 (3.0 - 3.3)
011 K6.04 (3.1 - 3.1)
011 A1.01 (3.5 - 3.6)
011 A2.11 (3.4 - 3.6)

Modified based on Boyle comments. Changed to Rev. 5, 6/18/11

Question 14 and 19 are similar in that they talk about the pressurizer level, one talks about the plant response the other talks about the instrument response. One is on a break, one is on the instrument failures. Resequenced the stem to be consistent Which ONE . . . .

Answer: A

20. 012 K4.08 4
Given the following plant conditions:

- Unit is at 40% power
- Solid State Protection System (SSPS) Train B Actuation Logic testing is being performed
- Train B SSPS Mode Selector Switch is in the TEST position
- Train B SSPS Input Error Inhibit Switch is in the INHIBIT position

Which ONE of the following describes the status of the Reactor if one 48-volt power supply were lost on Train A SSPS and why?

A. Reactor Trip with a GENERAL WARNING for BOTH Train A and Train B SSPS and all First Out annunciators illuminated.

B. Reactor at 40% power with a GENERAL WARNING for Train B SSPS ONLY.

C. Reactor Trip with GENERAL WARNING for BOTH Train A and Train B SSPS with no red First Out annunciator illuminated for the cause of the trip.

D. Reactor at 40% power with a GENERAL WARNING for Train A SSPS ONLY.

*Justification*

*A. Incorrect, Plausible because a Reactor Trip is generated, but a First Out annunciator will not occur because there is no condition for a first out*

*B. Incorrect, Plausible because a GENERAL WARNING is generated for a loss of either 48 VDC power supply, however, performing testing on the other Train generates a GENERAL WARNING for both Trains and the Unit trips.*

*C. Correct. Testing on one train of SSPS generates a GENERAL WARNING. A loss of any of the four DC power supplies in the other Train of SSPS also generates a GENERAL WARNING and opens the Reactor Trip Breakers.*

*D. Incorrect, Plausible because a GENERAL WARNING is generated for a loss of either 48 VDC power supply, however, performing testing on the other Train generates a GENERAL WARNING for both Trains and the Unit trips.*

**K/A Statement: Knowledge of RPS design features and/or interlocks which provide for the following: Logic matrix testing (CFR: 41.7)**

Technical Reference(s): EMG E-0, SY1301100, M-744-00019, ALR 00-075A, ALR 00-076A

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _NRC Bank______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___CPNPP March 2009 NRC RO_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__
55.43 _____

Comments:

Incorporated Boyle comments, changed to Rev. 4. 6/18/11

Answer: C

21. 013 K4.09 4

Which ONE of the following is an EXCEPTION to the bistable de-energize to actuate design criteria of the Engineered Safeguards Actuation System?

A. Steam line low pressure negative rate MSLI.

B. Safety Injection actuation.

C. Containment Isolation Phase A (CISA).

D. Containment spray actuation.

*Justification*

*A. Incorrect, de-energize to actuate (ESF signal)*
*B. Incorrect, de-energize to actuate (ESF signal)*
*C. Incorrect, de-energize to actuate (ESF signal)*
*D. Correct, energize to actuate (ESF signal)*

*RWST is also energize to actuate*

**K/A Statement: Knowledge of ESFAS design feature(s) and/or interlock(s) which provide for the following: Spurious trip protection (CFR: 41.7)**

Technical Reference(s): SY1301301, M-744-00025

Proposed references to be provided to applicants during examination: None

Learning Objective: R5/R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Incorporated Jane comments, changed to Rev. 4. 6/18/11

Answer: D

22. 014 A1.04 6

Given the following plant conditions:

- Plant is at 90% power
- AFD is at -1% on all four channels
- The RO attempts to insert control rods 8 steps to maintain Tavg/Tref

The following was observed by the RO:

- Group step counters counted down 8 steps
- DRPI indication for the affected rods did not change

Based on these conditions, what are the expected diverse indications assuming the DRPI System is functioning properly?

A.
- AFD would go more negative
- Power Range NIs would decrease
- No radial flux tilt change

B.
- AFD would go less negative (towards 0%)
- Power Range NIs would not change
- A small radial flux tilt will be noted

C.
- AFD would not change
- Power Range NIs would decrease
- A small radial flux tilt will be noted

D.
- AFD would not change
- Power Range NIs would not change
- No Radial flux tilt change

*Justification*

*A. Incorrect. Rods did not move. Group step counters get signal from Rod Control demanding motion. No changes would be noted on diverse indications*
*B. Incorrect. Rods did not move. Group step counters get signal from Rod Control demanding motion. No changes would be noted on diverse indications*
*C. Incorrect. Rods did not move. Group step counters get signal from Rod Control demanding motion. No changes would be noted on diverse indications*
*D. Correct*

**K/A Statement: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPIS controls, including: Axial and radial power distribution**

Technical Reference(s): ALR 00-079D, SY1301501, SY1300100, SY1301400

Proposed references to be provided to applicants during examination: None

Learning Objective: R1/R6

Question Source: Bank # _GSP Bank______
Modified Bank # _______
New _______

Question History: Last NRC Exam _____________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5__
55.43 _____

Comments:

Modified based on Brendan comments. Changed to Rev. 5, 6/9/11

Answer: D

23. 015 K3.02 5

Given the following plant conditions:

- Startup in progress
- Reactor power 50%
- Control Bank D rods are at 170 steps in Auto
- Power range monitor NI44 fails off scale HIGH over 30 seconds

Which ONE of the following is the expected INITIAL response of the Rod Control System without Operator action?

A. Rods drive in at max rate until rate input is zero.

B. Rods drive out at max rate until rate input is zero.

C. Rods drive in until C-5 permissive setpoint is reached.

D. Rods drive out until C-11 permissive setpoint is reached.

*JUSTIFICATION:*

*A. Correct; Rod Control Power Mismatch circuit (rate of change difference between primary power, NIS, vs secondary power, turbine impulse pressure), once the failed instrument stops- upper or high scale range peg, the mismatch change or rate input is 'zero'. Max rate is 72 spm.*

*B. Incorrect, opposite rod direction. Once the failed instrument stops- upper or high scale range peg, the mismatch change or rate input is 'zero'. Max rate is 72 spm.*

*C. Incorrect, right rod direction, C-5 is wrong. Once the failed instrument stops- upper or high scale range peg, the mismatch change or rate input is 'zero'. Max rate is 72 spm. C-5 is at 15% by impulse*

*D. Incorrect, opposite rod direction. Once the failed instrument stops- upper or high scale range peg, the mismatch change or rate input is 'zero'. Max rate is 72 spm.*

**K/A Statement: Knowledge of the effect that a loss or malfunction of the NIS will have on the following: CRDS (CFR: 41.7 / 45.6)**

Technical Reference(s): SY1301501, SY1300100, BD-OFN SB-008 - Att. R, M-744-00020, M-744-00021, M-744-00026

Proposed references to be provided to applicants during examination: None

Learning Objective: R7

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7__

55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 001 K1.05 | (4.5/4.4) | {41.2, 5, 6, 7} |
| | 001 K6.05 | [2.4/2.7] | {41.7} |
| | 015 K1.03 | [3.1/3.1] | {41.2, 5, 6, 7} |

Est. Time: 3 min.

Modified based on Brendan comments. Changed to Rev. 5, 6/6/11

Answer: A

24. 015/017 AA2.01 4
Given the following plant conditions:

- The unit is at 32% power
- The following SB069 windows are lit:
  - LO FLOW L3 FB434A
  - LO FLOW L3 FB435A
  - LO FLOW L3 FB436A

- "C" RCP indications are:
  - BB II-3, RCP C AMPS - '0' amps
  - Green and amber lights above the handswitch are lit
  - Flow - '0' on all indicators

- The other RCPs remain in service and the reactor trip breakers remain closed

Which ONE of the following identifies the condition causing the RCP trip and the required Operator action?

| | **Condition causing RCP Trip** | **Required Operator Action** |
|---|---|---|
| A. | Under voltage | Trip the reactor and go to EMG E-0, REACTOR TRIP OR SAFETY INJECTION |
| B. | Under voltage | Shutdown the plant IAW GEN-004, POWER OPERATION |
| C. | Overcurrent | Trip the reactor and go to EMG E-0, REACTOR TRIP OR SAFETY INJECTION |
| D. | Overcurrent | Shutdown the plant IAW GEN-004, POWER OPERATION |

*Justification*

*The RCPs have protection from undervoltage and underfrequency via relays. Both conditions can cause trips of the RCPs and if conditions and logic is met, the reactor would automatically trip.*

*A. Incorrect, The conditions in the stem describe the trip of RCP C from an undervoltage condition on the 13.8 Kv Bus feeding the RCP, however NO automatic trip would be initiated at the stated power level (below P8). Plausible because the condition causing the RCP trip is correct and if the power level had been greater than P8, an automatic reactor trip should have occurred. Tripping the reactor is not procedurally required.*

*B. Incorrect, The conditions in the stem describe the trip of RCP C from an undervoltage condition on the 13.8 Kv Bus feeding the RCP. With the reactor power level below P-8, no automatic reactor trip would be initiated from low flow condition in a single loop.*

*C. Incorrect, The conditions in the stem describe the a trip of RCP C from an undervoltage condition on the 13.8 Kv Bus feeding the RCP not an underfrequency trip. The underfrequency trip of the RCP requires 2/4 logic to be made in the SSPS which then will trip the reactor and all RCPs. The logic is not met in the stem even though power is above* *the P7 permissive (10%), only one RCPs is involved and the logic requires 2 out of 4. NO automatic trip would be initiated at the stated power level (below P8). Plausible because underfrequency can cause RCP trip with conditions different than stated in the stem and following the underfrequency initiation at greater than P7. Tripping the reactor is not procedurally required.*

D. *Correct, The conditions in the stem describe the trip of RCP C from an overcurrent condition not an underfrequency/undervoltage trip. The underfrequency trip of the RCP requires 2/4 logic to be made in the SSPS which then will trip the reactor and all RCPs. The logic is not met in the stem even though power is above the P7 permissive (10%), only one RCPs is involved and the logic requires 2 out of 4.*

*RCPC UV bistable in the same column would be lit (there is also a RCPC UF in that column). Ran this on the simulator and the RCPC RLY TROUBLE UV/UF did not light but the RCPC UV bistable did. SY1300300 Objective 6, Section 6.3 page 31 states the Trouble light actuates when there is a problem ONLY with the relay. IF NK bus power is lost (power feed to the RCP relays) the TROUBLE light would light, but the RCP would continue to run.*

**K/A Statement: Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Cause of RCP failure (CFR 43.5 / 45.13)**

Technical Reference(s): GEN 00-004, SY1300300, TS 3.4.4, TS Basis 3.4.4

Proposed references to be provided to applicants during examination: None

Learning Objective: R6

Question Source: Bank # __GSP Bank_____
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _____
55.43 __5__

Comments:

Modified based on Brendan comments. Changed to Rev. 4, 6/9/11. Doesn't require specific procedure actions only big picture, not SRO Only

Answer: D

25. 016 K5.01 6

Which ONE of the following explains the purpose of the Isolation Amplifier associated with the Steam Generator Pressure Instrument Loop?

A. Amplifies and integrates the pressure output signal between Containment and the instrument racks.

B. Isolates and integrates the pressure transmitter from the impacts of changing Containment pressures.

C. Protects the control signal from perturbation due to backfeed from a disturbance in the Reactor Protection System.

D. Protects the Reactor Protection signal from a perturbation due to backfeed from a disturbance in the control circuit.

*Justification*

*A. Incorrect, RVLIS amplifier, not an isolation amp, has an isolation bellows, no integration circuits*
*B. Incorrect, EQ issue, no integration circuits*
*C. Incorrect, opposite response*
*D. Correct.*

**K/A Statement: Knowledge of the operational implication of the following concepts as they apply to the NNIS: Separation of control and protection circuits (CFR: 41.5 / 45.7)**

Technical Reference(s): SY1301100 - Section 1.2, USAR 7.1.2.2.1, SY1301200

Proposed references to be provided to applicants during examination: None

Learning Objective: R1/R5

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __5__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 010 K1.01 | [3.9/4.1] | {41.7} |
| | 010 2.1.28 | [3.2/3.3] | {41.7} |

Est Time: 2 min.

Modified based on Lee comments. Changed to Rev. 6, 6/29/11

Answer: D

26. 022 A1.04 5

Given the following plant conditions:

- The unit is at 100% power
- XNB01 has a fault causing 018B, NB01 BUS UV, to alarm

All equipment operates as designed when the following sequence occurs:

- Alarm 055A, ESW PMP A PRESS LO, lights
- Annunciator 060E, CTMT SUMP A/B LEV HI, lights
- ESW "A" flow indicator stabilized at 9.05E6 lbm/hr
- Containment temperature is slowly rising

Which ONE of the following is causing the Containment conditions and what is the required crew response?

| | Initiating Event | Response |
|---|---|---|
| A. | Small RCS leak | Implement OFN BB-007, RCS LEAKAGE HIGH |
| B. | CCW line break inside Containment | Implement OFN EG-004, CCW SYSTEM MALFUNCTIONS |
| C. | ESW line break inside Containment | Implement OFN EF-033, LOSS OF ESSENTIAL SERVICE WATER |
| D. | Tripped CRDM fan | Check fan status on Control Board |

*JUSTIFICATION:*

*A. Incorrect; No rad monitor readings/alarms to indicate a RCS leak.*

*B. Incorrect; No CCW low pressure/expansion tank alarms to indicate CCW leakage.No effect on Ctmt temp.*

*C. Correct; ALR indicates system leakage as a possible cause of the low header pressure. That, coupled with containment sump alarm and increasing temperature indicates that the leakage is from ESW supply line to coolers.*

*D. Incorrect; Tripped ventilation equipment would not account for ESW low header pressure alarm nor the high moisture.*

**K/A Statement: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCS controls including: Cooling water flow (CFR: 41.5 / 45.5)**

Technical Reference(s): ALR 00-055A, OFN EF-33, LO1732443

Proposed references to be provided to applicants during examination: None

Learning Objective: R2/3

Question Source: Bank # _______
Modified Bank # _______

New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 022 K1.01 | [3.5/3.7] | {41.4, 5, 7} |
| | 022 A2.05 | (3.1/3.5) | {41.5, 43.5} |
| | 022 2.4.47 | [3.4/3.7] | {41.10, 43.5} |
| | 022 2.4.48 | [3.5/3.8] | {43.5} |
| | 076 2.4.47 | [3.4/3.7] | {41.10, 43.5} |
| | 076 2.4.48 | [3.5/3.8] | {43.5} |
| | 062 AA2.01 | [2.9/3.5] | {43.5} |

Est. Time: 4 min.

Modified based on Brendan comments. Changed to Rev. 5, 6/6/11

Answer: C

27. 022 A3.01 3

Given the following plant conditions:

- A LOCA has occurred

Which ONE of the following describes 1) the cooling water alignment to the Containment Coolers and 2) the speed required per cooler?

A. 1) Service Water
   2) Fast

B. 1) Service Water
   2) Slow

C. 1) ESW
   2) Slow

D. 1) ESW
   2) Fast

*Justification*

*A. Incorrect, wrong system, wrong speed*
*B. Incorrect, wrong system, right speed*
*C. Correct*
*D. Incorrect, right system, wrong speedflow*

*The Containment Fan Coolers are finned-tube type coolers supplied by the Essential Service Water System. Refer to Figure 4: Containment Coolers. The fans normally run in Fast speed, the sequencer starts them in Slow for accident conditions*

*The minimum required flow rate through each cooler is 1,000 gpm per cooler (2000 gpm per group) during normal operation and post-accident.*

**K/A Statement: Ability to monitor automatic operation of the CCS, including: Initiation of safeguards mode of operation (CFR: 41.7 / 45.5)**

Technical Reference(s): SY1302600, USAR 6.2.2.2.2.3, M-12EF02, M-12GN01

Proposed references to be provided to applicants during examination: None

Learning Objective: R8

Question Source: Bank # _______
Modified Bank # _58877______
New _______

Question History: Last NRC Exam ___2007 Callaway_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 022 K4.02 | [3.1/3.4] | {41.7} |
| | 013 K1.03 | [3.8/4.1] | {41.4, 5, 7, 7, 8, 9} |

Est. Time: 3 min.

Incorporated Brendan comments, changed to Rev. 3, 6/6/11

Answer: C

28. 022 AK1.02 2

Given the following plant conditions:

- The unit is at 100% power
- BG HCV-182, CHG HDR BACK PRESS CTRL, is closed slightly by the Reactor Operator

Which ONE of the following describes RCS Makeup flow response to the above condition?

| | Charging Pump Discharge Press | RCP Seal Injection Flow | Charging Flow to Regen Hx |
|---|---|---|---|
| A. | Increases | Increases | Decreases |
| B. | Increases | Decreases | Increases |
| C. | Decreases | Increases | Decreases |
| D. | Decreases | Decreases | Increases |

*Justification*

*A. Correct.*

*B. Incorrect, seal flow increases as BG HCV-182 is closed, charging flow to regen hx decreases as BG HCV-182 is closed.*

*C. Incorrect, charging pump disc. pressure increases as BG HCV-182 is closed.*

*D. Incorrect, charging pump disc. pressure increases as BG HCV-182 is closed, seal flow increases as BG HCV-182 is closed, charging flow to regen hx decreases as BG HCV-182 is closed.*

*Downstream of BG FE-121, a line branches from the charging header to supply the reactor coolant pump seals. RCP seal flow is controlled with BG HCV-182, Charging Header Flow Control Valve. This air-operated valve provides backpressure on the common discharge header to control the amount of water forced through the seal injection lines. Seal injection flow is set using throttle valves located in the South Mechanical penetration room. The further closed these throttle valves are the further closed BG HCV-182 must be to provide adequate seal flow. These throttle valves are set using a Tech. Spec. Surveillance and have caused problems with CCPs maintaining PZR level at 120 GPM Letdown. BG HCV-182 is positioned from the MCB panel RL001 by adjusting a potentiometer. This valve fails open on a loss of instrument air or control power.*

**K/A Statement: Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Pump Makeup: Relationship of charging flow to pressure differential between charging and RCS (CFR 41.8 / 41.10 / 45.3)**

Technical Reference(s): SY1300400, ALR 00-042E, M-12BG03

Proposed references to be provided to applicants during examination: None

Learning Objective: R3/4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis _X___

10 CFR Part 55 Content:
55.41 _8, 10_
55.43 _____

Comments:

Incorporated Lee/Jane comments, Replaced K/A due to overlap, Changed to Rev . 2, 6/9/11

Answer: A

29. 025 AK3.02 5
Given the following plant conditions:

- The plant is in MODE 4
- 2 RCPs are running
- RCS temperature is 342°F
- RCS pressure is 325 psig
- PZR level is 25%
- "A" train RHR is in service

Which ONE of the following describes the effect, if any, on the RHR System operation and required Operator response if RCS pressure rises to 450 psig?

| | **RHR System Effect** | **Operator Response** |
|---|---|---|
| A. | RHR Suction Relief lifts | Open a PZR PORV to reduce pressure |
| B. | RHR Suction Relief lifts | Open a PZR Spray Valve to reduce pressure |
| C. | RHR Isolates | Open a PZR PORV to reduce pressure |
| D. | RHR Isolates | Open a PZR Spray Valve to reduce pressure |

*Justification*

*A. Incorrect, first part correct, PORV not directed, below LTOP for 342F*
*B. Correct.*
*C. Incorrect, first part see below, second part not directed*
*D. Incorrect, first part see below, second part correct*

*There are no closing interlocks or any automatic signals associated with Hot Leg Suction valves. These valves fail “as is.”*

**K/A Statement: Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Isolation of RHR low-pressure piping prior to pressure increase above specified level (CFR 41.5, 41.10 / 45.6 / 45.13)**

Technical Reference(s): ALR 00-049B, SY1300500, M-12EJ01, M-12BB04, GEN 00-002

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _5, 10_
55.43 _____

Comments:

Modified based on Brendan comments. Changed to Rev. 5, 6/1511

Answer: B

30. 026 2.4.2 6

Given the following plant conditions:

- A pipe break has occurred in the "A" train Component Cooling System (CCW)
- The CRS enters OFN EG-004, CCW SYSTEM MALFUNCTIONS
- CCW Train "A" is supplying the Service loop
- Surge Tank "A" level is 18% and DOWN FAST
- Annunciator 060E, CTMT SUMP A/B LEV HI, is lit

Which ONE of the following describes the Operator response to this event?

A. Trip the Reactor when Surge Tank "A" level decreases to 14%.

B. Isolate CCW Return from RCP Thermal Barriers by closing EG HV-62, to stop a leak identified on the Containment Building Return Header.

C. Stop and lockout all "A" train ECCS pumps and the Containment Spray pump due to loss of seal cooling.

D. Verify ESW makeup is automatically aligned to CCW Surge Tank "A" due to the normal makeup being inadequate.

*Justification*

*A. Correct, per OFN foldout*
*B. Incorrect, Surge Tank level would be increasing for a Thermal Barrier leak, closing return does not affect supply*
*C. Incorrect, Ctmt Spray pumps not placed in PTL*
*D. Incorrect, ESW alignment is a manual action in OFN RNO, Step 3*

**K/A Statement: Loss of Component Cooling Water. Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)**

Technical Reference(s): ALR 00-051D, OFN EG-004, LO1732414, SY1400800, M-12EG01

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Other K/A: 026 AK3.03 [4.0 / 4.2]

Modified based on Jane comments. Changed to Rev. 5, 6/18/11

Answer: A

31. 026 A2.07 3
Given the following plant conditions:

- A LOCA has occurred
- The crew has transferred suctions to the Containment Recirc. Sump
- EJ LI-7, CTMT RECIRC SUMP, Train A indicates 1998' 0” decreasing
- EJ LI-8, CTMT RECIRC SUMP, Train B indicates 2000' 6" decreasing
- Containment Spray pump A amps are oscillating
- Containment Spray pump B amps are steady

Which ONE of the following describes the impact of these levels and the Operator response?

| | **Impact** | **Response** |
|---|---|---|
| A. | Recirc Sump "A" and “B” are low | Place both Ctmt Spray pump switches in Stop |
| B. | Recirc Sump “A” and "B" are low | Monitor both Ctmt Spray pumps for signs of cavitation |
| C. | Recirc Sump "A" ONLY is low | Place "A" Ctmt Spray pump switch in Stop |
| D. | Recirc Sump "B" ONLY is low | Place "B" Ctmt Spray pump switch in Pull-to-Lock |

*Justification:*

A. *Incorrect, first part correct, wrong response, should place ONLY "A" switch in STOP. PTL is used to prevent pumps from starting with an inadequate suction or wrong plant conditions.*
B. *Incorrect, sump level is adequate, should place ONLY "A" switch in STOP. PTL is used to prevent pumps from starting with an inadequate suction or wrong plant conditions.*
C. *Correct. Meets conditions for Step 1 RNO b. for one less than 1999’ 7” and BOTH trains decreasing for RHR and meets foldout page criterion for securing CTMT Spray Pumps.*
D. *Incorrect, sump level is adequate, should place ONLY "A" switch in STOP. PTL is used to prevent pumps from starting with an inadequate suction or wrong plant conditions.*

**K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of containment spray pump suction when in recirculation mode, possibly caused by clogged sump screen, pump inlet high temperature exceeded cavitation, voiding), or sump level below cutoff (interlock) limit (CFR: 41.5 / 43.5 / 45.3 / 45.13)**

Technical Reference(s): EMG C-13, BD-EMG C-13, LO1732336

Proposed references to be provided to applicants during examination: None

Learning Objective: R3/R4

Question Source: Bank # _______
Modified Bank # _______
New ___X____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5___
55.43 __5___

Comments:

Incorporated Lee/Jane comments, changed to Rev. 3 7/6/11

Answer: C

32. 027 2.2.22 4

Given the following plant conditions:

- The unit is at 63% power
- The Reactor Operator is responding to a Pressurizer pressure control malfunction
- The plant is approaching DNBR limits
- The RO recognizes that an action which is outside Technical Specifications or license conditions must be taken

Which ONE of the following describes the correct Operator action?

A. The RO shall immediately take appropriate actions necessary and inform the SRO when time permits.

B. The RO should take no action until a procedure is developed or revised.

C. The RO shall obtain approval from a licensed SRO prior to taking action.

D. The RO should obtain approval from the TSC prior to taking action.

*Justification:*

*A. Incorrect. Response is correct for taking immediate actions, but this is a 10CFR50.54(x, y) situation.*

*B. Incorrect. Correct answer for a normal procedural situation, but this is a 10CFR50.54(x, y) situation.*

*C. Correct. SRO approval required per 10CFR50.54(x).*

*D. Incorrect. Certain emergencies in the EOPs do require TSC approval, but the TSC is not staffed in these conditions.*

**K/A Statement: Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2)**

Technical Reference(s): AP 21-003 (6.6), 10CFR50.54 x & y, LO1733203, TS 2.0

Proposed references to be provided to applicants during examination: None

Learning Objective: R1

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __5___
55.43 __2___

Comments:

Other K/A: 027 G2.1.2 [3.0 - 4.0] {41.10, 45.13}

Modified based on Brendan comments. Changed to Rev. 4, 6/6/11

Answer: C

33. 027 K2.01 4

Given the following plant conditions:

- Containment Atmosphere Control Fan CGR01A has been placed in service
- A total loss of offsite power has occurred that results in a Reactor Trip

Which ONE of the following describes how the loss of offsite power affects CGR01A operation?

A. De-energized due to load shed of non-vital equipment.

B. De-energized since 480v bus PG19 has lost power.

C. Energized from 480v bus NG01 and still in service.

D. Energized from 480v bus PG19 and still in service.

*Justification*

*A. Incorrect, right response, wrong action, no load shed*
*B. Correct.*
*C. Incorrect, opposite response, wrong bus*
*D. Incorrect, opposite response right bus*

*CGR01A is powered from 480v bus PG19, this is a non-vital bus that will not have power*

**K/A Statement: Knowledge of bus power supplies to the following: Fans (CFR: 41.7)**

Technical Reference(s): SYS GR-120, SY1302800, CKL GR-120, M-12GR01, E-13GR01

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _46895______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___2008 DCPP_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Modified based on Brendan comments. Changed to Rev. 4, 6/6/11

Answer: B

34. 028 A2.01 4

Calculate the "B" Hydrogen Recombiner initial power setting using the attached curve assuming the following information is:

- Pre LOCA CTMT Temperature = 105°F
- Post LOCA CTMT Pressure = 23 psia
- Reference Power Plaque setting = 46.9

*(REFERENCE PROVIDED)*

A. 63.32

B. 64.25

C. 64.72

D. 65.19

*Justification*

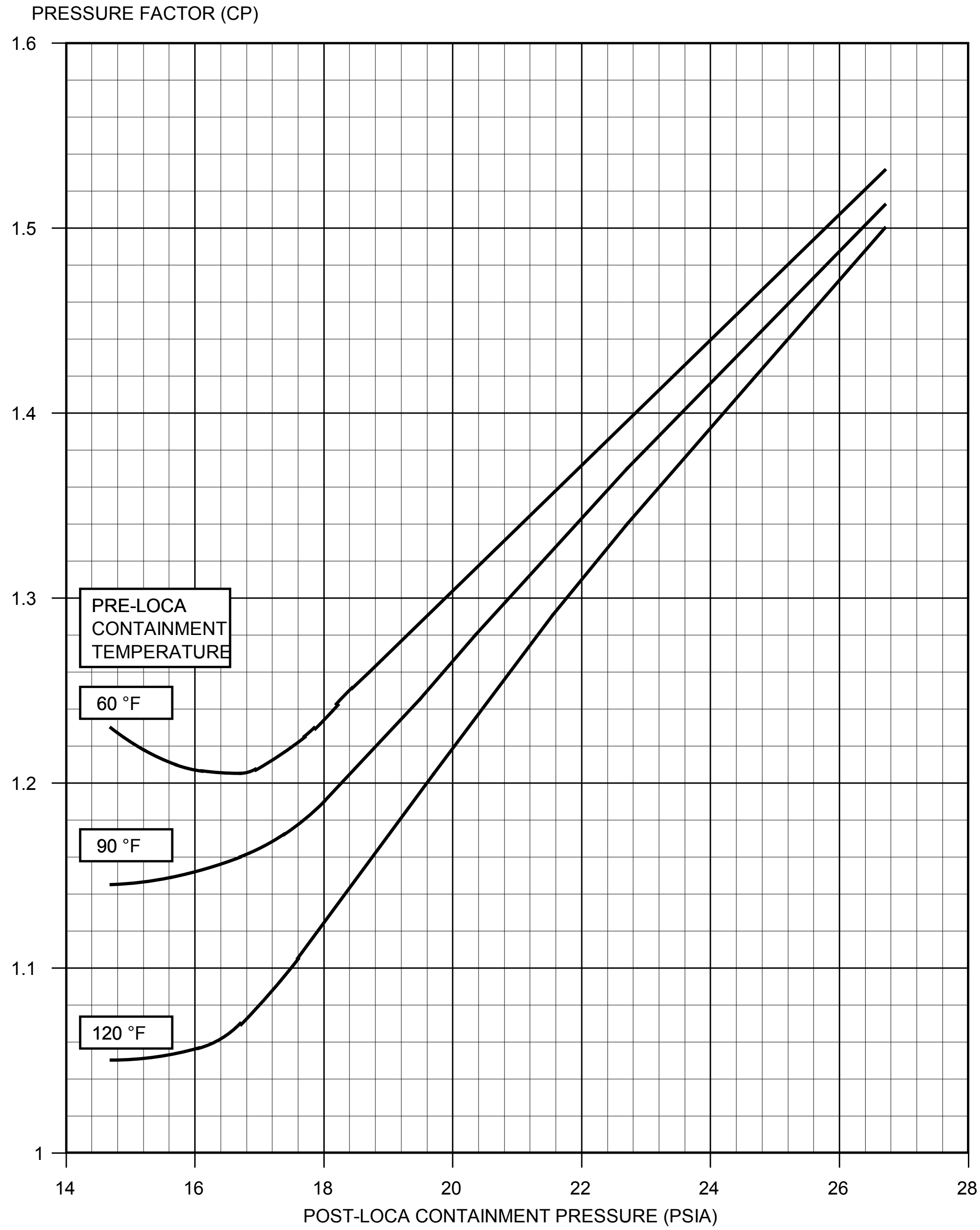
*A. Incorrect, 120 @1.35*
*B. Correct*
*C. Incorrect, 90 @1.38*
*D. Incorrect, 75 @1.39*

*6.3.3*

*Record from Plant Operating Logs the Pre-LOCA Containment temperature.*

*Determine pressure factor (Cp), using FIGURE 1, DRY CONTAINMENT RECOMBINER CORRECTION FACTOR VS. CONTAINMENT PRESSURE.*
*Containment Pressure ____________ Cp **(1.37)***

*Multiply the reference power (plaque on Recombiner Control Panels) by Cp to determine required recombiner power setting, as indicated on the power meter.*
*SGS01A Reference Power _**46.9**______ X Cp __**1.37**______ = __**64.25**_______ Power Setting*




**K/A Statement: 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: Hydrogen recombiner power setting, determined by using plant data book (CFR: 41.5 / 43.5 / 45.3 / 45.13)**

Technical Reference(s): SYS GS-120, SY1302800

Proposed references to be provided to applicants during examination: Step 6.3.3 and Figure 1

Learning Objective: R5

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __5___

55.43 __5___

Comments:

Modified based on Jane comments. Changed to Rev. 4, 6/22/11

Answer: B

35. 028 AK2.03 5

Given the following plant conditions:

- The unit is at 100% power
- The upper controlling PZR level transmitter (BB LT-459) fails at program level

Assuming NO Operator action, which ONE of the following describes the INITIAL effect if a turbine runback to 80% occurs?

A. Charging flow increases and actual PZR level increases.

B. Charging flow decreases and actual PZR level decreases.

C. Charging flow remains constant and actual PZR level increases.

D. Charging flow remains constant and actual PZR level decreases.

*Justification:*

*A. Incorrect, flow remains constant and PZR level increases (RCS Temp. increases).*

*B. Incorrect, wrong flow response due to failure, opposite PZR level direction.PZR level initially increases as Tavg goes up, then decreases as rods and dumps drive temp. down w/o charging flow control.*

*C. Correct. Level indication higher than program level, transient failure prevents repositioning of flow control valve and PZR level increases (RCS Temp. increases).*

*D. Incorrect, right charging flow response, opposite level direction initially increases due to swell.*

**K/A Statement: Knowledge of the interrelations between the Pressurizer Level Control Malfunctions and the following: Controllers and positioners (CFR 41.7 / 45.7)**

Technical Reference(s): OFN SB-008, BD-OFN SB-008, M-12BB02, LO1732418, SY1301000

Proposed references to be provided to applicants during examination: None

Learning Objective: R4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7___
55.43 _____

Comments:

Other K/A: 028 AA1.02 (3.4/3.4) {41.7}

| | | | |
|---|---|---|---|
| | 011 K1.01 | [3.6/3.9] | {41.3, 7} |
| | 011 K3.01 | [3.2/3.4] | {41.7} |
| | 011 K4.04 | [3.0/3.3] | {41.7} |
| | 011 K6.09 | [2.4/2.6] | {41.7} |
| | 011 A3.02 | [2.6/2.8] | {41.7} |
| | 011 A3.03 | [3.2/3.3] | {41.7} |
| Est Time: | 4 min | | |

Modified based on Jane comments. Changed to Rev. 5, 7/2/11

Answer: C

36. 029 A4.01 3
Given the following plant conditions:

- The unit is at 50% RTP
- A Containment depressurization is in progress per SYS GT-120, CONTAINMENT MINI-PURGE SYSTEM OPERATIONS

Which ONE of the following describes the effect on the operating purge equipment following a loss of NK01?

A. Train B dampers go closed, fans stay running.

B. Train B dampers go closed, fans stop.

C. Train A dampers go closed, fans stay running.

D. Train A dampers go closed, fans stop.

*Justification*

*A. Incorrect, GT HZ-4, 11 remain open, fans remain running*
*B. Incorrect, fans remain running fans still run*
*C. Correct. GT HZ valves 5, 12 go closed, fans remain running*
*D. Incorrect, GT HZ 5, 12 close, fans remain running*

*"A" Train GT HZ-5 & 12 NK01 power supply - fail closed*
*"B" Train GT HZ-4 & 11 NK04 power supply - fail closed*
*CGT02 power supply is PG25H - not affected by NK01/4 loss*
*SGT02 power supply is PG19N - not affected by NK01/4 loss*

*Mini-purge supply & Ctmt exhaust isolation dampers GT HZ-4 & 11 close. Ctmt mini-purge air supply unit, SGT02, remains running & Ctmt mini-purge exhaust fan CGT02, remains running.*

*Mini-purge supply & Ctmt exhaust isolation dampers GT HZ-5 & 12 close. Ctmt mini-purge air supply unit, SGT02, remains running & Ctmt mini-purge exhaust fan CGT02, remains running.*

**K/A Statement: Ability to manually operate and/or monitor in the control room: Containment purge flow rate (CFR: 41.7 / 45.5 to 45.8)**

Technical Reference(s): OFN NK-020, LO1732430, SY1302800 (R7), M-12GT01

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7__

55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 029 K2.04 | [2.1/2.3] | {41.7} |
| | 063 K3.02 | [3.5/3.7] | {41.7} |
| | 058 AA2.02 | [3.5/3.9] | {43.5} |
| | 058 AK3.02 | [4.0/4.2] | {41.5, 10} |

Est Time: 4 min

Modified based on Lee/Jane comments. Changed to Rev. 3, 3/22/11

Answer: C

37. 034 2.2.12 5
Given the following plant conditions:

- The unit is in MODE 6
- "A" train RHR is in service
- Refueling Pool level is 23' above the fuel on BB LI-53A, RCS LEVEL WR COLD CAL LOOP 4
- Control Rod Shaft Unlatching is the next evolution
- All Refueling personnel are on station

Which ONE of the following describes whether or not unlatching can begin and why or why not?

A. Yes, level and RHR are adequate.

B. Yes, ONLY proper level is required.

C. No, RHR loops are inadequate.

D. No, level is inadequate.

*Justification*

*A. Correct, level is adequate, RHR (one train operating & in-service) adequate.*
*B. Incorrect, water level is inadequate.*
*C. Incorrect, RHR loops are adequate for button unlatching evolution.*
*D. Incorrect, level is adequate, must be 23' above flange to move fuel.*

*STS CR-002, Att. A, P 30/44 Data Sheet 1 Step A23*

**K/A Statement: Knowledge of surveillance procedures. (CFR: 41.10 / 45.13)**

Technical Reference(s): LO1732109, GEN 00-009, STS CR-002, TR 3.9.7, TS 3.9.6

Proposed references to be provided to applicants during examination: None

Learning Objective: R5

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __10_
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 5, 6/18/11

Answer: A

38. 035 A3.01 4

Given the following plant conditions:

- The unit is operating at 100% power
- The "A" SG controlling pressure transmitter fails **HIGH**

Which ONE of the following describes the INITIAL feedwater flow response and the INITIAL Operator action?

| | **Initial Response** | **Operator Action** |
|---|---|---|
| A. | Feedwater flow would decrease. | Place the "A" MFRV in MANUAL and restore level to program. |
| B. | Feedwater flow would increase. | Place the "A" MFRV in MANUAL and restore level to program. |
| C. | Feedwater flow would decrease. | Leave the "A" MFRV in AUTO because SG level is the dominant control signal and will restore feed flow to match steam flow. |
| D. | Feedwater flow would increase. | Leave the "A" MFRV in AUTO because SG level is the dominant control signal and will restore feed flow to match steam signal. |

*JUSTIFICATION:*

*A. Incorrect; Compensating pressure transmitter failing high will cause steam flow to indicate high, which will cause an increase in feed flow. The operator response is correct.*

*B. Correct. Compensating pressure transmitter failing high will cause steam flow to indicate high, which will cause an increase in feed flow. The operator response is correct.*

*C. Incorrect; Compensating pressure transmitter failing high will cause steam flow to indicate high, which will cause an increase in feed flow. The operator response is incorrect based on OFN. C and D distractor are valid because actual SG level is the dominant control signal and if the LCV were left in auto, it should match FF/SF after some time delay, however OFN provide direction for transferring to Man control.*

*D. Incorrect; Compensating pressure transmitter failing high will cause steam flow to indicate high, which will cause an increase in feed flow. The operator response is incorrect based on OFN*

**K/A Statement: Ability to monitor automatic operation of the S/G including: S/G water level control. (CFR: 41.7 / 45.5)**

Technical Reference(s): OFN SB-008 Att. C, LO173241, BD-OFN SB-008, ALR 00-111C

Proposed references to be provided to applicants during examination: None

Learning Objective: R4

Question Source: Bank # _______

Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 035 A2.04 | [3.6/3.8] | {41.5, 43.5} |
| | 035 A2.03 | [3.4/3.6] | {41.5, 43.5} |
| | 035 A4.01 | [3.7/3.6] | {41.7} |
| | 054 AA2.08 | [2.9/3.3] | {43.5} |

Est. Time: 2 min.

Modified based on Brendan comments. Changed to Rev. 4, 6/6/11

Answer: B

39. 037 AA1.05 6

Given the following plant conditions:

- The unit has been at power for 100 days
- A Steam Generator Tube Leak is suspected
- The Control Room (CR) staff has just entered OFN BB-07A, STEAM GENERATOR TUBE LEAKAGE
- Reactor Power 4%
- Pressurizer Level 28% and stable
- Pressurizer Pressure 2235 psig

Which ONE of the following describes the radiation monitors that would provide the CR an alarm for leakage greater than 30 gallons per day?

A.
- BM RE-25, SG Blowdown Process Rad
- BM RE-52, SG Blowdown Effluent Rad
- SJ RE-02, SG Blowdown Sample Rad

B.
- BM RE-25, SG Blowdown Process Rad
- GE RE-92, Condenser Off Gas Rad
- GT RE-21A, Unit Vent Effluent

C.
- BM RE-52, SG Blowdown Effluent Rad
- GE RE-92, Condenser Off Gas Rad
- GT RE-21A, Unit Vent Effluent

D.
- BM RE-25, SG Blowdown Process Rad
- GE RE-92, Condenser Off Gas Rad
- SJ RE-02, SG Blowdown Sample Rad

*Justification*

*A. Incorrect, 52 not credited in TRM*
*B. Incorrect, 21A not credited in TRM or listed in OFN 7A, unit vent is downstream of filters*
*C. Incorrect, 52 and 21A not credited in TRM*
*D. Correct. See table TR 3.3.18-1*

**K/A Statement: Ability to operate and / or monitor the following as they apply to the Steam Generator Tube Leak: Radiation monitor for auxiliary building exhaust processes (CFR 41.7 / 45.5 / 45.6)**

Technical Reference(s): OFN BB-07A, SY1407300, TRM 3.3.18 & Bases, LO1732436

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _18294______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 6, 7/6/11

Answer: D

40. 038 EA1.15 6

Given the following plant conditions:

- A steam generator tube rupture has occurred on Loop "D" SG
- The TDAFW pump is running, providing 700 gpm flow
- Both MDAFW pumps are running, providing 250 gpm per pump
- EMG E-3, STEAM GENERATOR TUBE RUPTURE, has been implemented by the operating crew
- The cooldown to target T/C of 484°F is in progress
- CST is currently at 90% level

Which ONE of the following is the expected **usable** CST volume AFTER cooldown has been completed?

Assume the following:

- Cooldown will take 25 minutes
- AFW pump discharge flow remains constant during the cooldown

*(REFERENCE PROVIDED)*

A. 362,662 gallons

B. 377,317 gallons

C. 384,989 gallons

D. 407,317 gallons

*Justification*

*A. Incorrect, 80% level*
*B. Correct, See below*
*C. Incorrect. 85% level.*
*D. Incorrect, 90% level*

*CST @ 90% = 407,317 gal*
*(25 min) (700 + 250 + 250) = 30,000 gal*
*CST (after) = 377,317 gal*

**K/A Statement: Ability to operate and monitor the following as they apply to a SGTR: AFW source level and capacity (chart) (CFR 41.7 / 45.5 / 45.6)**

Technical Reference(s): EMG E-3, TAP01, BD-EMG E-3, LO1732325

Proposed references to be provided to applicants during examination: TAP01

Learning Objective: R6

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__

55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 6, 7/2/11

Answer: B

41. 039 K5.08 3

Given the following plant conditions:

- Unit is at 20143 MWD/MTU
- The unit is critical at $10^{-10}$ amps with all systems and components normal
- S/G Atmospheric Relief Valve AB PV-4 fails OPEN

Which ONE of the following describes the effect the failure will have on Reactor power, RCS temperature, and RCS pressure?

| | <u>Power</u> | <u>Temperature</u> | <u>Pressure</u> |
|---|---|---|---|
| A. | Increase | Decrease | Increase |
| B. | Decrease | Decrease | Decrease |
| C. | Increase | Increase | Decrease |
| D. | Increase | Decrease | Decrease |

*Justification:*

*A. Incorrect. Pressure will not increase since Tavg decrease.*
*B. Incorrect. Power will increase since MTC is large and negative.*
*C. Incorrect. Temperature will decrease since heat removal > heat production.*
*D. Correct. Temperature decrease will insert positive reactivity. Thus power increase. Pressure will decrease since $T_c$ decreases causing pressurizer level to lower causing pressure to decrease.*

**K/A Statement: Knowledge of the operational implications of the following concepts as the apply to the MRSS: Effect of steam removal on reactivity (CFR: 441.5 / 45.7)**

Technical Reference(s): LO1610500, LO1732451, OFN AB-041

Proposed references to be provided to applicants during examination: None

Learning Objective: R3/R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 039 K3.05 | [3.6/3.7] | {41.7} |
| | 192008 K1.10 | [3.3/3.4] | {41.1} |

Est Time: 4 min

Incorporated Brendan comments. Changed to Rev. 3, 6/6/11

Answer: D

42. 054 AK1.02 5

Given the following plant conditions:

- The crew is responding to a loss of secondary heat sink event caused by a loss of Normal and Auxiliary Feedwater
- SG wide range levels are all 5%
- SG pressures are all 1060 psig
- Bleed and Feed cooling has been initiated per EMG FR-H1, RESPONSE TO LOSS OF SECONDARY HEAT SINK
- RCS hot leg temps are 556°F
- CETC are 586°F and stable
- Containment pressure is 3.6 psig
- Containment radiation is 1 R/hr

Which ONE of the following describes the INITIAL AFW flowrate and why?

AFW Flow is to be . . .

A. above 35,000 lbm/hr to ONE SG to prevent an excessive cooldown

B. below 35,000 lbm/hr to ONE SG to prevent an excessive cooldown

C. below 35,000 lbm/hr to ALL SGs to prevent an uncontrolled S/G pressure decrease

D. above 35,000 lbm/hr to ALL SGs to prevent an uncontrolled S/G pressure decrease

*Justification:*

*A. Incorrect. Adverse Feed/bleed number from foldout page, not termination level, purpose is cooldown not thermal stress*

*B. Correct. Basis for Step 41 see below*

*C. Incorrect, basis for controlling cooldown rate, purpose is cooldown not pressure decrease*

*D. Incorrect, basis for controlling cooldown rate, purpose is cooldown not pressure decrease*

*Need to determine adverse ctmt or not (No)*

*When feedwater flow is restored to a steam generator, high flow rates may cause RCS temperature to rapidly decrease. This is especially applicable when main feedwater is used to restore steam generator inventory. Although rapid cooldown of the RCS can produce temperature induced stress with the potential for loss of vessel integrity under high pressure conditions, it is likely that the vessel would have already been subjected to a rapid cooldown prior to reestablishing feedwater flow, due to the injection of relatively cold SI water during bleed and feed. After reestablishing feedwater flow, minimizing the rate of RCS cooldown is more beneficial for operator controllability of the plant (by minimizing coolant shrinkage and pressure transients) than integrity of the vessel. Guidance for preventing excessive RCS cooling is included in FR-H1 to enhance operator control of the transient.*

*It should be noted that increasing the time to termination of bleed and feed by minimizing feedwater flow is not a concern, since the greatest threat to vessel integrity has already occurred and the containment atmosphere has already been subjected to a mass release. Once feedwater flow is restored, its effectiveness as a heat sink for the RCS can be determined by decreasing RCS temperatures (cold legs, hot legs, core exit thermocouples) with increasing steam generator level. These parameters should be monitored when controlling feedwater flow, to prevent excessive RCS cooldown. After feedwater flow has been restored, feedwater flow should be maintained on scale and controlled as necessary to maintain increasing steam generator level and slowly decreasing RCS temperatures.*

**K/A Statement: Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW): Effects of feedwater introduction on dry S/G (CFR 41.8 / 41.10 / 45.3)**

Technical Reference(s): EMG FR-H1, BD-EMG FR-H1, LO1732346

Proposed references to be provided to applicants during examination: None

Learning Objective: R1

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 _8, 10_
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 5, 7/6/11

Answer: B

43. 051 2.4.31 2

Given the following plant conditions:

- The unit is at 95% power
- AC PI-204, LP TURBINE A EXHAUST PRESSURE indicated 5.2 HgA and slowly rising
- 30 minutes later Annunciator 116B, COND A VAC LO, has alarmed
- The crew has entered ALR 00-116B

Which ONE of the following describes normal Condenser conditions and appropriate crew response if condition is not met?

A. Check exhaust pressure <5.5 inches HgA

Manually trip the turbine and enter EMG E-0, REACTOR TRIP OR SAFETY INJECTION

B. Check exhaust pressure <5.0 inches HgA

Manually trip the reactor and enter EMG E-0, REACTOR TRIP OR SAFETY INJECTION

C. Check exhaust pressure <5.0 inches HgA

Reduce turbine load as necessary to be within Figure 2 limits for LP Turbine Exhausts A & B IAW OFN AF-025, UNIT LIMITATIONS

D. Check exhaust pressure <5.5 inches HgA

Reduce turbine load as necessary to be within Figure 2 limits for LP Turbine Exhaust A & B IAW OFN AF-025, UNIT LIMITATIONS

*Justification*

*A. Incorrect, reactor is tripped not the turbine, reactor trip is only for < 30% power.*
*B. Incorrect, reactor trip is only for < 30% power.*
*C. Correct. Step F3 b and RNO.*
*D. Incorrect, 5.5 pressure is for Condenser C.*

**K/A Statement: Knowledge of annunciator alarms, indications, or response procedures. (CFR: 41.10 / 45.3)**

Technical Reference(s): ALR 00-116B, OFN AF-025, SY1505500, LO1732435

Proposed references to be provided to applicants during examination: None

Learning Objective: R5/R3

Question Source: Bank # _______
Modified Bank # _______
New ___X____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 _10__

55.43 _____

Comments:

Incorporated Lee/Jane comments, Replaced K/A due to overlap, changed to Rev. 2
6/9/11

Answer: C

44. 040 AK1.03 4

Given the following plant conditions:

- The unit is in MODE 3
- The operating crew observes abnormal conditions on:
  - RCS temperature
  - RCS pressure
  - Pressurizer level
  - Containment pressure

Which ONE of the following parameters is used to differentiate between the early stages of a moderately sized RCS Pressure Boundary Leak or a moderately sized Secondary Steam Break?

A. RCS Pressure

B. Pressurizer Level

C. RCS Temperature

D. Containment Pressure

*Justification:*

*A. Incorrect. RCS pressure would reduce during both events.*

*B. Incorrect. Pressurizer level would decrease during both events, one is a shrink the other is a loss of inventory.*

*C. Correct. RCS temperature should follow faulted S/G pressure, temperature does not decrease on an RCS break.*

*D. Incorrect. Containment pressure would increase during both events.*

**K/A Statement: Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture: RCS shrink and consequent depressurization (CFR 41.8 / 41.10 / 45.3)**

Technical Reference(s): BD-EMG E-1, BD-EMG E-0, LO1610500, BD-ERG E-1 (Figs. 1, 2, 3, 4, 15, 16, 17, 18, 19), LO1732320

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:

55.41 _8, 10_
55.43 _____

Comments:

Est Time: 3 min.

Modified based on Brendan comments. Changed to Rev. 4, 6/6/11

Answer: C

45. 055 EA1.01 7
Given the following plant conditions:

- The plant experienced a Station Blackout
- The crew entered EMG C-0, LOSS OF ALL AC
- The TSC diesel has failed to start and maintenance personnel are troubleshooting
- After 3 hours the diesel has not been started

Which ONE of the following describes where the Operator would be able to monitor core temperatures?

A. NPIS terminal

B. Reference Junctions

C. Incore Thermocouple Cabinet

D. Hot Leg RTD meters on the MCB

*Justification:*

*A. Incorrect. NPIS terminal will have no power after 2 hours.*

*B. Incorrect. Not accessible during power ops.*

*C. Correct. The analysis for not using the Hot Leg RTD meters in BD-EMG C-0, refers to BD-EMG F-0. BD-EMG F-0 does not allow Hot Leg RTD meters to be used because they are unreliable.*

*D. Incorrect. EMG bases document and F-0 requires at least 5 thermocouples; one near the center of the core and the hottest in each quadrant, not Thot. Hot Leg RTD meters not used because they are unreliable.*

**K/A Statement: Ability to operate and monitor the following as they apply to a Station Blackout: In-core thermocouple temperatures (CFR 41.7 / 45.5 / 45.6)**

Technical Reference(s): EMG C-0, BD-EMG F-0, BD-EMG C-0, SY1301700, SY1408301

Proposed references to be provided to applicants during examination: None

Learning Objective: R4R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Incorporated Jane comments. Changed to Rev. 7, 7/2/11

Answer: C

46. 059 K4.17 4

Which ONE of the following describes the design feature to limit feed water flow following a reactor trip?

A. High level (60%) in 2/4 steam generators.

B. Lo-Lo level (25.7%) in 2/4 steam generators.

C. P-4 signal with 2/4 low Tavg signals.

D. Both main feedwater pumps trip.

*Justification*

*A. Incorrect, level setpoint is 78% (carryover)*
*B. Incorrect, setpoint is 23.5% (heat sink)*
*C. Correct.*
*D. Incorrect, AFP start signal (anticipatory)*

**K/A Statement: Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Increased feedwater flow following a reactor trip (CFR: 41.7)**

Technical Reference(s): SY1505900, SY1505902, M-744-00030, M-12AE01, M-761-00098, M-744-00022, TS Bases 3.3.2 for P-4

Proposed references to be provided to applicants during examination: None

Learning Objective: R6

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Other K/A: 007 EA1.02 (3.8-3.7)
013 K1.15 (3.4-3.8)

Incorporated Brendan comments, changed to Rev. 4, 6/9/11

Answer: C

47. 061 AK3.02 3

Given the following plant conditions:

- The unit is steady-state at 75% power
- Annunciator 00-062A, AREA RAD HIHI, has just alarmed
- The unexpected alarm SD RI-29, HOT MACHINE SHOP, is valid and reads 65 mr/hr

In addition to determining the area affected, which ONE of the following RO actions must be performed?

A. Direct Health Physics to survey the area and evacuate the entire radiologically controlled area.

B. Dispatch an Auxiliary Operator to investigate the Hot Machine Shop high radiation alarm.

C. Announce over the PA system to evacuate personnel from the Hot Machine Shop.

D. Notify the SM to evacuate the entire radiologically controlled area.

*Justification:*

*A. Incorrect. HP is notified of alarm only, no evacuation of the entire RCA.*
*B. Incorrect. Dispatching an AO would unnecessarily expose him to high radiation. Not required by ALR.*
*C. Correct. ALR 00-062A.*
*D. Incorrect. SM permission not required, no evacuation of the entire RCA.*

**K/A Statement: Knowledge of the reasons for the following responses as they apply to the Area Radiation Monitoring (ARM) System Alarms: Guidance contained in alarm response for ARM system (CFR 41.5,41.10 / 45.6 / 45.13)**

Technical Reference(s): ALR 00-062A, SY1407200

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 _5, 10_
55.43 _____

Comments:

Other K/A: 2.4.10 [3.0/3.1] {41.10, 43.5}

Est Time: 2 min

Incorporated Brendan comments, changed to Rev. 3, 6/7/11

Answer: C

48. 061 K6.01 4

Given the following plant conditions:

- TDAFW Pump testing is in progress per STS AL-103, TDAFW Pump Inservice Pump Test
- The BOP opens FC HV-312A, Trip and Throttle Valve, and the TDAFW Pump speed stabilizes at 1100 RPM and will NOT increase

Which ONE of the following describes the probable cause of the TDAFW Pump failing to achieve the required speed?

A. Loss of 48 VDC Control Power.

B. Failure of the governor valve to OPEN.

C. Failure of the oil pump to CLOSE the governor valve.

D. Failure of Limit Switch 6 on FC HV-312A to make-up.

*Justification*

*A. Incorrect, valves would fail close on loss of power. Would result in overspeed*

*B. Incorrect, GV is normally open, oil pressure closes GV.*

*C. Incorrect, opposite response. Would result in overspeed*

*D. Correct. LS-6 starts the ramp generator to increase from 1100 rpm*

**K/A Statement: Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: Controllers and positioners (CFR: 41.7 / 45.7)**

Technical Reference(s): STS AL-103, SY1406100, E-13FC24, M-12FC02

Proposed references to be provided to applicants during examination: None

Learning Objective: R4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Incorporated Jane comments, changed to Rev. 4, 7/6/11

Answer: D

49. 062 2.1.28 3

Given the following plant conditions:

- The plant is operating at 100% power
- ESW Pump Discharge pressure indicates 106 psig on both trains
- Strainer D/P is 4 psid
- ESW load temperatures are rising
- A cold front has quickly moved through the area
- Lake temperature is 33°F
- Air temperature is 21°F
- Time is currently 1830 hours
- The crew has entered OFN EF-033, LOSS OF ESSENTIAL SERVICE WATER

Which ONE of the following describes the cause of the above conditions and the component(s) available to restore load cooling?

A. Frazil Ice formation

ESW Warming Line

B. Frazil Ice formation

ESW Pump Recirculation lines

C. Clogged Pump Strainer

Locally start the cleaning cycle using EF HIS-19

D. Clogged Pump Strainer

Locally open EF PDV-19, Trash Valve

*Justification*

*A. Correct.*
*B. Incorrect, recirc lines are for pump protection not ice prevention*
*C. Incorrect, strainer D/P is within limits, correct component*
*D. Incorrect, strainer D/P is within limits, correct component*

**K/A Statement: Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)**

Technical Reference(s): ALR 00-055A, ALR 00-055B, OFN EF-033, SYS EF-205, SY1006002

Proposed references to be provided to applicants during examination: None

Learning Objective: R4/R6

Question Source: Bank # _______
Modified Bank # _______
New ___X____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__

55.43 _____

Comments:

Incorporated Jane comments. Changed to Rev. 3, 7/2/11

Answer: A

50. 062 A1.03 5

Given the following plant conditions:

- The unit is at 100% RTP
- Operators are swapping NN04 power supply to XNN05 Sola Transformer

Which ONE of the following describes the effect on the plant of making this transfer **WITHOUT** the guidance in SYS NN-200, TRANSFERRING NN BUSSES BETWEEN POWER SOURCES?

A. SG level low-low reactor trip

B. Pressurizer level decreasing

C. VCT swapover to the RWST

D. BG FCV-462, NCP Flow Control Valve, fails open

*JUSTIFICATION:*

A. *Incorrect, with the loss of NN04 this input is not a controlling channel.*
B. *Incorrect, with the loss of NN04 this input is not a controlling channel.*
C. *Correct. BG LT112 failing low would cause the RWST to Charging pump suction valve BN LV112D to open and VCT outlet valve BG LCV112A to close causing a boration. Power restoration alone would not realign these valves requiring Operator action. Aligning the RWST would provide a constant boration to the RCS providing negative reactivity, lowering RCS temperature.*
D. *Incorrect, with the loss of NN04 this component is not affected.*

**K/A Statement: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ac distribution system controls including: Effect on instrumentation and controls of switching power supplies (CFR: 41.5 / 45.5)**

Technical Reference(s): OFN NN-021, SYS NN-200, E-11010, LO1732431, SY1506300, SY1300400

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 062 A2.01 | [3.4/3.9] | {41.5, 43.5} |
| | 062 K3.01 | [3.5/3.9] | {41.7} |
| | 057 AA1.01 | [3.7/3.7] | {41.7} |

Est. Time: 3 min

Incorporated Lee/Jane comments, changed to Rev. 5, 6/27/11

Answer: C

51. 063 2.1.31 3

Given the following sequence of events:

- Plant is at 100% power all systems normally aligned
- Loss of Vital DC Bus NK04 occurs

Which ONE of the following is the expected indication that correctly reflects current plant lineup?

A. Both MDAFW pumps start and all MFRV and bypass valves fail open.

B. "B" train P-14 solenoids on all MFRV and bypass valves deenergize causing valves to fail closed.

C. Steam line pressure transmitters to "B" and "D" ARV's deenergize and "B" and "D" ARV's indicate closed.

D. Turbine Driven AFW pump starts and AFW flow can be throttled to all S/Gs.

*JUSTIFICATION:*

A. *Incorrect – A MDAFW pumps start ONLY and MFRV and Bypass valaves fail closed when the FWI solenoid powered from NK04 is de-energized closing the valves.*
B. *Correct - 125VDC power is required to maintain the P-14 solenoids open. Closing the solenoid removes control air from the valve and it fails shut.*
C. *Incorrect – D ARV pressure transmitter and controller is de-energized ONLY*
D. *Incorrect – "A' MDAFWP starts and the TDAFWP starts when SG level shrinks below 23.5% in more than 1 SG, "A" Train AFW 'smart' valves can be throttled, however flow is unaffected because the TDAFWP discharge valves are failed full open in this condition.*

**K/A Statement: Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup. (CFR: 41.10 / 45.12)**

Technical Reference(s): E-13AE06, E-13AE07, E-13RL03, M-12AE01, SY1505900, OFN NK-020

Proposed references to be provided to applicants during examination: None

Learning Objective: R10/R5

Question Source: Bank # _22283______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _10__
55.43 _____

Comments:

Incorporated Jane comments.  Changed to Rev. 3 6/27/11

Answer: B

52. 063 K3.02 3

Which ONE of the following describes the effects of a loss of DC control power to 4160 VAC breaker NB0112, NB01 MN FDR BKR FROM XNB01? (Assume that this breaker is the only component affected by this loss of DC power.)

A. Breaker will fail in its current position and can be opened, but not closed, from the MCB.

B. Breaker will trip automatically and can be closed, but not opened from the MCB.

C. Breaker will fail in its current position and cannot be tripped or closed from the MCB.

D. Breaker will immediately trip and cannot be tripped or closed from the MCB.

*Justification*

*A. Incorrect, breaker cannot be opened from the MCB*
*B. Incorrect, no operations from the MCB*
*C. Correct, OFN NK-020*
*D. Incorrect, stays in its current position*

**K/A Statement: Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: Components using DC control power (CFR: 41.7 / 45.6)**

Technical Reference(s): SYS NK-131, OFN NK-020, E-11NK01, E-13NB12, E-13NB13, LO1732430

Proposed references to be provided to applicants during examination: None

Learning Objective: R1

Question Source: Bank # _18590______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 058 AA2.03 | [3.5/3.9] | {43.5} |
| | 012 K4.07 | [3.0/3.2] | {41.7} |

Modified based on Lee/Jane comments. Changed to Rev. 3, 3/22/11

Answer: C

53. 064 K6.08 6

Given the following plant conditions:

- The plant is in MODE 1
- STS KJ-011A, DG NE01 24 HOUR RUN, is in progress
- It started at 0830
- EDG Fuel Oil Storage Tank, TJE01A, level indicates as follows:

    - 0800 90%
    - 1200 87%
    - 1600 84%
    - 2000 81.5%
    - 2400 78.5%

- Annunciator 089B, DG FUEL TK A LEV LO, alarmed at ~1145

Which ONE of the following describes when and which Technical Specification would be entered?

*(REFERENCE PROVIDED)*

A. 2000, TS 3.8.1, AC Sources - Operating, should be entered

B. 2000, TS 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air, should be entered

C. 2400, TS 3.8.1, AC Sources - Operating, should be entered

D. 2400, TS 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air, should be entered

*Justification*

*A. Incorrect, wrong LCO, approximately 80%, or 85,300 gallons is minimum TS required level, may consider EDG inoperable*
*B. Incorrect, wrong time approximately 80%, or 85,300 gallons is minimum TS required level*
*C. Incorrect, wrong LCO, may consider EDG inoperable.*
*D. Correct. Approximately 80%, or 85,300 gallons is minimum TS required level.*

*~660 gals/hr at full load*
*90% - 95,236*
*87.4% is alarm ~93,150 gals, ALR initiated action to fill tank*
*87% - 92,596*
*84% - 89,956*
*81.5% - 87,316*
*79.5% - 85,336, sometime around 2330 reach TS limit*
*78.5% - 84,676*

***ALR NOTE At 80% level, the diesel generator may continue to run for approximately 7 days at rated capacity before running out of fuel.***

**K/A Statement: Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Fuel oil storage tanks**

Technical Reference(s): TS 3.8.3, SR 3.8.3.1, WCRE-03, TJE01A & B, SY1406400, ALR 00-089B

Proposed references to be provided to applicants during examination: TJE01A & B, TS 3.8.1/3.8.3

Learning Objective: R10

Question Source: Bank # _______
Modified Bank # _58957______
New _______

Question History: Last NRC Exam ___2007 Callaway_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 6, 6/22/11

Answer: D

54. 069 AK1.01 3

Which ONE of the following transients is ANALYZED to result in the highest Containment pressure **AND** the greatest leakage out of Containment?

| | **Highest Pressure** | **Greatest Total Leakage** |
|---|---|---|
| A. | Design basis LOCA | Design basis Steam Line Break inside Containment |
| B. | Pressurizer vapor space LOCA | Design basis LOCA |
| C. | Design basis Steam Line Break inside Containment | Pressurizer vapor space LOCA |
| D. | Design basis Steam Line Break inside Containment | Design basis LOCA |

*Justification*

*A. Incorrect, most energy and volume of liquid, highest peak pressure, most leakage, opposite responses*
*B. Incorrect, small leak size limits containment pressure*
*C. Incorrect, first part correct, limited pressure rise, less leakage*
*D. Correct, large spike in pressure, but limited amount of volume*

**K/A Statement: Knowledge of the operational implications of the following concepts as they apply to Loss of Containment Integrity: Effect of pressure on leak rate (CFR 41.8 / 41.10 / 45.3)**

Technical Reference(s): USAR Figures 6.2.1-1, 6.2.1-2, 6.2.1-81, and 6.2.1-82, LO1610722, LO1610720, LO1610721

Proposed references to be provided to applicants during examination: None

Learning Objective: R4/R5/R7

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 _8, 10_
55.43 _____

Comments:

Incorporated Jane comments, changed to Rev. 3, 7/6/11

Answer: D

55. 073 2.1.30 5

Given the following plant conditions:

- The unit is at 75% power
- A spike occurs on Radiation monitor GT RE-21B, Unit Vent Wide Range Gaseous Monitor (WRGM) and peaked at 2 x $10^5$ $\mu$Ci/$cm^3$
- Radiation monitor GT RE-21B is now reading 2.5 x $10^{-1}$ $\mu$Ci/$cm^3$.

Which ONE of the following describes the operation of GT RE-21A, Unit Vent Effluent Monitor?

A. A valid reading is available on the Unit Vent Effluent Monitor GT RE-21A - Iodine channel.

B. Place the WRGM Control Room electronics for GT RE-21B to the next highest indicating range. The Accident Isolate mode must be reset locally.

C. A valid reading is available on the Unit Vent Effluent Monitor GT RE-21A - Particulate channel.

D. Unit Vent Effluent Monitor GT RE-21A channels are no longer valid. The Accident Isolate mode must be reset locally.

*Justification*

*A. Incorrect, effluent is NOT being monitored at this point*
*B. Incorrect, over-ranged on the monitor, off-scale high, correct action*
*C. Incorrect, effluent is NOT being monitored at this point*
*D. Correct, see step 4.8 of SYS SP-121*

*SY1407300*

*The function of the WRGM is to detect, indicate and alarm the presence of gaseous radioactivity in their respective airborne sample streams during normal and accident conditions.*

*The integral components of each WRGM are a sample conditioning skid, sample detection skid, an RM-80, and Control Room electronics.*

*GT RE-21B:*
*Sample detection skid: The sample detection skid consists of two lead shielded detector assemblies. One assembly houses the low range radioactivity (high-flow) beta scintillation detector. The other assembly houses the mid-high range radioactivity (low-flow) cadmium telluride (CdTe), chlorine-doped, solid-state sensor detectors. Each CdTe detector output is coupled to a preamplifier in the detector assembly.*

*This skid also contains a power controller for the WRGM system, two pumps (low and high range sample pumps), valves, flow transducers, flow control valves, and lead shielded electronics. The sample detection skid, under the control of the RM-80, extracts a gas sample from the effluent stack that is representative of the effluent conditions. The low range sample line uses a 1/4 HP, 120VAC vacuum pump for sample flow. The mid/high range sample line uses a 1/40 HP, 120VAC vacuum pump for sample flow. Upon exiting the detector skid, the sample returns to the effluent plenum exhaust.*

*WRGM detector(s) total range is 1E-7 to 1E+5 mCi/$cm^3$. During normal operation only the low radiation range path is used, and the mid/high radiation range path is shutdown. The mid/high radiation range path is automatically placed into operation when radioactivity in the sample meets a predetermined level. As the radioactivity level continues to increase, the low radiation range path is shutdown at a predetermined level.*

*A placard on the WRGM states that GT RE-21A will go into the Accident Isolate Mode of operation when the mid-high range pump is ON.*

*WRGM Control Room electronics:*
*The Control Room electronics of each WRGM are located on panel SP010, located the behind the Control Room desk. The assembly contains an RM-23 for control of the RM-80. Also, in the same assembly, are controls for the sample conditioning skid filters and grab sample collection*

*Unit Vent effluent monitor (a Particulate Iodine monitor), GT RE-21A, has an* ***Accident Isolation*** *mode of operation. Upon receipt of an Alert gaseous radioactivity alarm from its WRGM (GT RE-21B), the PI monitor airborne sample is drawn from the room it's located in (purge), rather than the effluent stack it monitors.*

*The Alert gaseous radioactivity alarm causes the effluent stack sample inlet motor operated valve to close, and the purge air motor operated valve to open. The* ***Accident Isolation*** *mode of operation is indicated at the monitor by a lit red light. The Control Room does not have indication at the RM-23 (at the SP010 panel) that the monitor has gone into the Accident Isolate mode. The RM-11R will indicate gray for the PI monitor and indicates the monitor is in purge mode, but no alarms are generated. The* ***Accident Isolate*** *mode of operation protects the particulate and iodine detectors in GT RE-21A from exposure to high levels of radioactivity. Once it is in Accident Isolate mode, the Unit Vent Effluent is not being monitored for particulate and iodine radioactivity.*

**K/A Statement: Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)**

Technical Reference(s): SY1407300, SYS SP-121

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _60037______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Modified based on Brendan comments. Changed to Rev. 5, 6/10/11

Answer: D

56. 073 K1.01 3
Given the following plant conditions:

- The unit is at 100% power, EOL
- Fuel handling is in progress for outage preps
- A depleted fuel assembly is dropped
- Gas bubbles are seen rising to the surface

Which ONE of the following describes the radiation monitor in alarm, and the status of the Emergency Exhaust fans and Fuel Building Supply fans?

| | Radiation Monitor in Alarm | Emergency Exhaust Fans | Fuel Building Supply Fan |
|---|---|---|---|
| A. | GG RE-27 | Running | Stopped |
| B. | GG RE-27 | Stopped | Running |
| C. | GT RE-22 | Running | Stopped |
| D. | GT RE-22 | Stopped | Running |

*Justification*

*A. Correct: RE-27 or 28 will initiate action*

*B. Incorrect: Right monitor, opposite fans status*

*C. Incorrect: Wrong process radiation monitor 22/33 are for Ctmt Purge, GG RE-27 and GG RE-28 are the process radiation monitors for the Fuel Building. Correct fan response*

*D. Incorrect: Wrong process radiation monitor 22/33 are for Ctmt Purge, GG RE-27 and GG RE-28 are the process radiation monitors for the Fuel Building. Opposite fans response.*

**K/A Statement: Knowledge of the physical connections and/or cause-effect relationships between the PRM system and the following systems: Those systems served by PRMs (CFR: 41.2 to 41.9 / 45.7 to 45.8)**

Technical Reference(s): ALR 00-062D, SY1301301

Proposed references to be provided to applicants during examination: None

Learning Objective: R2/R3

Question Source: Bank # _______
Modified Bank # _______
New ___X____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _3, 4_

55.43 _____

Comments:

Incorporated Jane comments.  Changed to Rev. 3, 7/2/11

Answer: A

57. 076 A1.02 3

Given the following plant conditions:

- Plant startup in progress
- Lake temperature 33°F
- Normal system alignments

Which ONE of the following describes temperature control to prevent exceeding design limits in the Turbine Building Closed Cooling Water System (EB)?

A. Service Water flow through both heat exchangers are controlled by EA HV-030, Turbine Bldg CLCW HX 1A/1B Service Water Return.

B. CLCW flow through heat exchanger EB01A is controlled using the CLCW HX Outlet isolation, EB V-008.

C. The heat exchanger bypass valve EB TV-009, CLCW Temp Control Valve, bypasses Service Water around the in-service heat exchanger.

D. The heat exchanger bypass valve EB TV-009, CLCW Temp Control Valve, bypasses Closed Cooling Water around the in-service heat exchanger.

*Justification:*

*A. Incorrect: EA HV-030 is full open isolation valve under normal alignment and fails open on loss of air.*
*B. Incorrect: Wrong outlet valve for "A" Hx, open to allow EB TV-009 to control temperature.*
*C. Incorrect: The HX bypass valve bypasses CLCW around the HX for temperature control and can bypass up to 90% of full flow.*
*D. Correct*

*Objective 1 - SY1507400*

*Heat is transferred to service water via the Closed Cooling Water heat exchanger. Service water temperature ranges from a maximum expected 90ºF to 33°F and is supplied to the Closed Cooling Water heat exchangers. The Closed Cooling Water System provides a continuous supply of water and corrosion-inhibitor, at a maximum expected temperature of 105ºF, to cool Turbine Building loads.*

*Objective 2 - SY1507400*

*An 8-inch bypass line around the heat exchangers contains a temperature flow control valve, EB TV-9. This valve controls heat exchanger bypass flow to maintain the desired closed cooling water system outlet temperature via temperature indicating controller, EB TIC-9. As outlet temperature increases, the valve will reduce bypass flow to increase closed cooling water flow through the heat exchanger.*

*Closed Cooling Water heat exchangers are designed for continuous operation at a maximum closed cooling water flow rate of approximately 930 gpm. Even at full normal system flow and maximum service water temperature, some closed cooling water bypasses the heat exchanger. During low service water temperature conditions, 90% of the closed cooling water flow will bypass the heat exchangers.*

**K/A Statement: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: Reactor and turbine building closed cooling water temperatures. (CFR: 41.5 / 45.5)**

Technical Reference(s): SYS EB-120 section 6.1, M-12EB01, SY1507400

Proposed references to be provided to applicants during examination: None

Learning Objective: R1/R2

Question Source: Bank # _______
Modified Bank # _58975______
New _______

Question History: Last NRC Exam ___2007 Callaway_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 __5__
55.43 _____

Comments:

Modified based on Lee/Jane comments. Changed to Rev. 3, 3/22/11

Answer: D

58. 077 AA2.04 5
Given the following plant conditions:

- The unit is at 100% power
- Generator Hydrogen pressure is 50 psig
- PF is 0.87
- 700 megavars out going

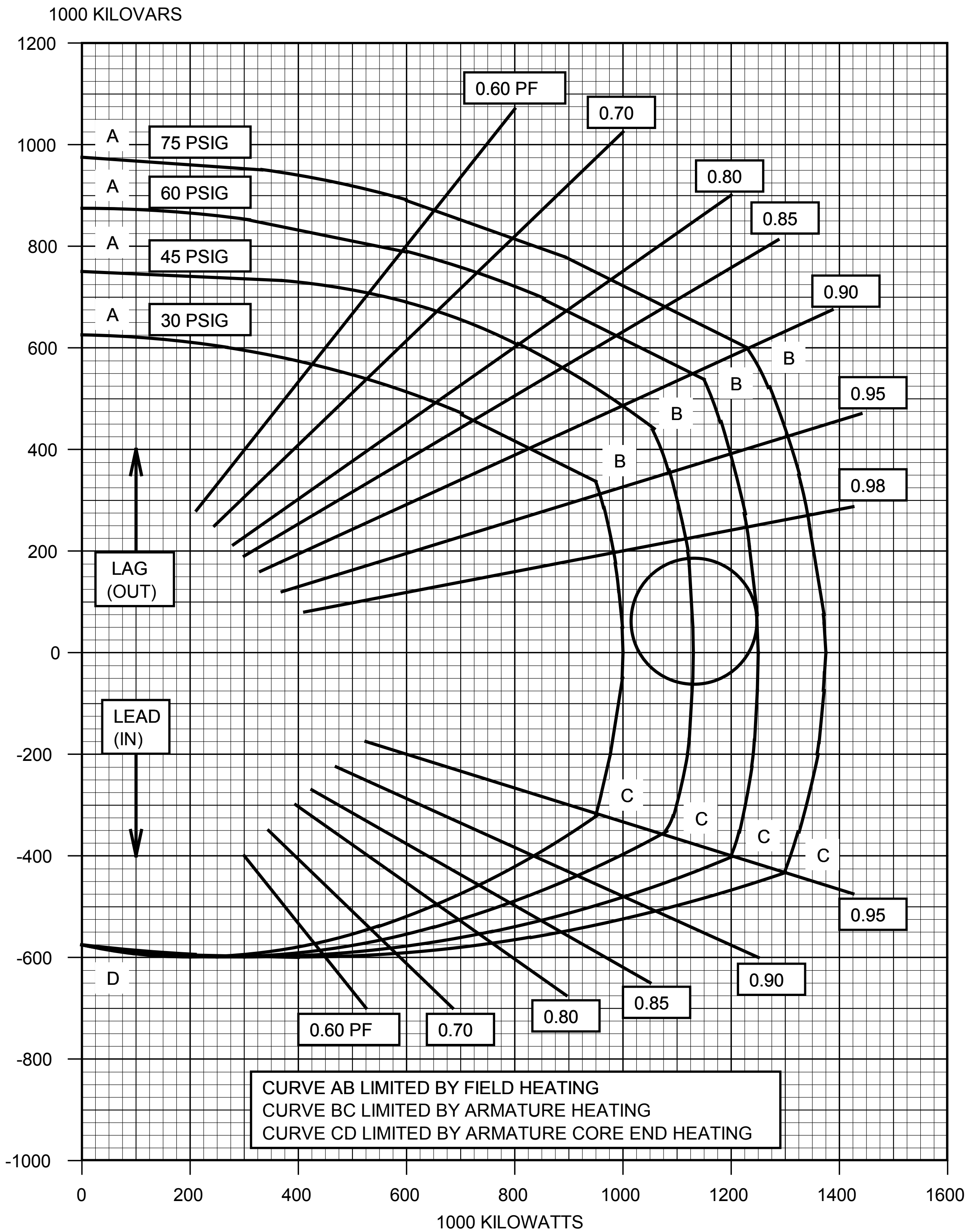
Which ONE of the following describes **CURRENT** plant condition and the required Operator action?

*(REFERENCE PROVIDED)*

| | **Current Plant Condition** | **Operator Action** |
|---|---|---|
| A. | VARs are outside the capability curve | Reduce VARs to reduce armature heating |
| B. | VARs are outside the capability curve | Reduce VARs to reduce field heating |
| C. | VARs are within the capability curve | Reduce VARs to reduce armature heating |
| D. | VARs are within the capability curve | Reduce VARs to reduce field heating |

*Justification*

*A. Incorrect, first part correct, wrong action.*
*B. Correct. current plant conditions are outside the curve. AB curve is for field heating*
*C. Incorrect, first part wrong, second part wrong*
*D. Incorrect, first part wrong, second part correct.*




**K/A Statement: Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: VARs outside the capability curve (CFR: 41.5 and 43.5 / 45.5, 45.7, and 45.8)**

Technical Reference(s): OFN AF-025, SY1502300, SY1504502

Proposed references to be provided to applicants during examination: Figure 1

Learning Objective: R7/R9

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5___
55.43 __5___

Comments:

Incorporated Jane comments, changed to Rev. 4, 6/18/11

Answer: B

59. 078 A3.01 5

Given the following plant conditions:

- Instrument Air (IA) Compressor "A" is operating as the LEAD compressor.
- IA Compressor "B" is in an AUTO-START condition as the LAG compressor.
- IA Compressor "C" is in STANDBY.
- The following sequence of events occur:
  - At 1415, 092A, COMPRESS AIR PRESS LO, alarms as pressure drops to 112 psig.
  - At 1416, 091A, INSTR AIR DRYER PRESS LO, alarms as pressure drops to 100 psig.
  - All other Control Room alarms related to the IA System remain clear.
  - At 1420, a stuck-open pre-filter relief valve on dryer Train B reseats.
  - At 1422, alarm 091A has cleared, 092A still in, header pressure is 100 psig

At 1424, assuming NO additional Operator actions and with IA Compressor "A" running and loaded, which ONE of the following is the status of IA Compressors "B" and "C"?

IA Compressor "B" is _____1)_____ and IA Compressor "C" is _____2)_____.

A. 1) running and unloaded; 2) running and unloaded

B. 1) running and loaded; 2) shutdown

C. 1) running and unloaded; 2) shutdown

D. 1) running and loaded; 2) running and loaded

*Justification*

*A. Incorrect, see below.*
*B. Incorrect, see below.*
*C. Incorrect, see below.*
*D. Correct, From SY1407800:*

*The air header pressure at which the compressors will start is as follows:*

- *The normal operating compressor (lead compressor) cycles between 116 and 125 psig.*
- *The first standby (lag) compressor starts when system pressure drops to 114 psig, and unloads at 123 psig.*
- *The second standby compressor starts at 112 psig, and unloads at 121 psig.*

*With the stated conditions in the stem all KA Comp. are running and loaded.*

**K/A Statement: Ability to monitor automatic operation of the IAS, including: Air pressure**

Technical Reference(s): SYS KA-120, 121, SY1407800, ALR 00-091A, ALR 00-092A, M-12KA06

Proposed references to be provided to applicants during examination: None

Learning Objective: R5

Question Source: Bank # _47197______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___CPNPP 2009_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7__

55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 5, 7/2/11

Answer: D

60. 078 K1.04 2

Given the following plant conditions:

- KA HSS-310, Sequencer Selector Switch is in position B-C-A
- "B" Instrument Air compressor is running
- The turbine watch opens KA-V1475, AIR COMP CKA01B RTN HDR DRAIN, causing a very high flow condition
- Annunciator 00-092E, AIR CMPSR B TROUBLE, is in alarm

Which ONE of the following describes the cause for the trouble alarm?

The compressor tripped due to . . . .

A. high temperature.

B. low oil pressure.

C. high oil pressure.

D. motor overload.

*Justification*

*A. Correct. High dP thru EF HV-044 sensed by EF PDT-44 isolates cooling water*
*B. Incorrect, loss of cooling water should not cause low oil pressure*
*C. Incorrect, loss of cooling water should not cause high oil pressure*
*D. Incorrect, loss of cooling water should not cause motor overload, but is plausible due to motor effects*

**K/A Statement: Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: Cooling water to compressor (CFR: 41.2 to 41.9 / 45.7 to 45.8)**

Technical Reference(s): ALR 00-092E, SY1407800, SY1408900, M-12EF01, M-12KA01

Proposed references to be provided to applicants during examination: None

Learning Objective: R3/R4

Question Source: Bank # _______
Modified Bank # _______
New ___X____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 _2-9_
55.43 _____

Comments:

Incorporated Lee/Jane comments, Replaced K/A 5/27/11 due to not applicable to WC, changed to Rev. 2, 6/9/11

Answer: A

61. 103 A2.04 7

Given the following plant conditions:

- The unit is in MODE 6
- A loss of shutdown cooling has occurred
- Slightly increased radiation levels are observed
- Steady wailing sound is heard in Containment

Which ONE of the following describes the event and the response that will be directed?

| | **Event** | **Response** |
|---|---|---|
| A. | Containment Purge Isolation | Evacuate Containment |
| B. | Containment Purge Isolation | Stop reactor vessel head lift |
| C. | Containment Evacuation Alarm | Evacuate Containment |
| D. | Containment Evacuation Alarm | Actuate Containment Purge Isolation |

*Justification:*

*A. Incorrect. CPIS potential since the unit is in refueling, right action.*
*B. Incorrect. CPIS potential since the unit is in refueling, wrong action.*
*C. Correct.*
*D. Incorrect. Wrong signal, OFN requires Phase A (step 25).*

**K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the containment system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations : Containment evacuation (including recognition of the alarm) (CFR: 41.5 / 43.5 / 45.3 / 45.13)**

Technical Reference(s): SY1301501, GEN 00-009, OFN EJ-015

Proposed references to be provided to applicants during examination: None

Learning Objective: R11

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5___
55.43 __5___

Comments:

Other K/A: 015 2.4.10 [3.0/3.1] {41.10, 43.5}

Est Time: 4 min

Modified based on Jane comments. Changed to Rev.7, 7/6/11

Answer: C

62. 2.1.18 4

Given the following plant conditions:

- A reactor trip occurring three days ago was originally attributed to and logged as being caused by rod drive MG breaker failures
- After significant trouble shooting the actual cause of the trip was determined to be from several dropped rods

Which ONE of the following describes the process for addressing the original autolog log entry?

A. A late entry should be made stating the correct cause of the trip and the original entry should be annotated to refer to the new entry by page and line number.

B. The original entry should be corrected and initialed by the person who made that entry, with the date and time of the correction indicated.

C. The original entry should be corrected and initialed by the person who determined the correct cause, with the date and time of the correction indicated.

D. A late entry should be made stating the actual cause of the trip and refer to the original entry with the date, time and person.

*Justification*

*A. Incorrect, first part correct, original entries are not changed IAW AP 21-001, 6.5.3, you would use a late entry*
*B. Incorrect, original entries are not changed IAW AP 21-001, 6.5.3, you would use a late entry*
*C. Incorrect, original entries are not changed IAW AP 21-001, 6.5.3, you would use a late entry*
*D. Correct.*

*Corrections to electronic log entries may be made prior to archiving by the individual that made the initial entry. Corrections to others log entries shall include whose log entry was corrected along with the date the entry was corrected.*

*Logging of information and/or events should be done in chronological order. If an "after the fact" entry is made, it should be logged using the actual time of the event, if during that shift.*

*If an "after the fact" log entry is made for a shift before the current one, the "Late Entry" checkbox in AUTOLOG should be checked.*

**K/A Statement: Ability to make accurate, clear, and concise logs, records, status boards, and reports. (CFR: 41.10 / 45.12 / 45.13)**

Technical Reference(s): AP 21-001, LO1733211

Proposed references to be provided to applicants during examination: None

Learning Objective: R4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge __X__

Comprehension or Analysis _____

10 CFR Part 55 Content:

55.41 _10__

55.43 _____

Comments:

Modified based on Brendan comments. Changed to Rev. 4, 6/11/11.

Answer: D

63. 2.1.36 6

Given the following plant conditions:

- Refueling is in progress
- Fuel movement is being restarted after a long delay

Which ONE of the following would require suspension of fuel movement?

A. Only one RHR pump is in operation.

B. Containment air temperature is 110°F.

C. Communications between the Control Room and Refueling personnel has been checked every 9 hours.

D. STS CR-002, SHIFT LOG FOR MODES 4 5 AND 6, was completed except that GK RE-4, Control Room Air In Gas Act, is out of service, and RE-5 is out of calibration.

*Justification*

*A. Incorrect, normally only one in service TS 3.9.5*
*B. Incorrect, not a limit to move fuel TS 3.6.5*
*C. Incorrect, at least once per 12 hours is required per Attachment A, STS CR-002, A.27, checked every 8 by the checklist*
*D. Correct, RE-4 and 5 required to be operable, A. 21*

**K/A Statement: Knowledge of procedures and limitations involved in core alterations. (CFR: 41.10 / 43.6 / 45.7)**

Technical Reference(s): LO1732109, GEN 00-009, STS CR-002, TS table 3.3.7-1

Proposed references to be provided to applicants during examination: None

Learning Objective: R2/R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 _10___
55.43 __6___

Comments:

Modified based on Brendan comments. Changed to Rev. 6, 6/15/11

Answer: D

64. 2.1.45 3

Given the following plant conditions:

- The plant has experienced a large break LOCA
- All safeguards equipment operated as designed
- The crew has transitioned to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION
- Annunciator 00-047C, RWST LEVEL LOLO2, is illuminated
- Indications are as follows:

  1. EJ LI-7 CTMT RECIRC SUMP LEV = 2002' 5"
  2. EJ LI-8 CTMT RECIRC SUMP LEV = 2002' 6"
  3. LF LI-9 CTMT NORM SUMP LEV = 2001'
  4. LF LI-10 CTMT NORM SUMP LEV = 2001'
  5. BN LI-930 RWST LEV = 11%
  6. BN LI-931 RWST LEV = 11%
  7. BN LI-932 RWST LEV = 13%
  8. BN LI-933 RWST LEV = 12%

Which ONE of the following identifies parameters used to accurately determine if the alarm is valid?

A. 1, 5, 7, 8

B. 2, 3, 5, 8

C. 2, 4, 6, 7

D. 1, 2, 5, 6

*Justification*

*A. Incorrect. 7 & 8 are reading high compared to the diverse indications.*

*B. Incorrect. 3 is reading low & 8 is reading high compared to the diverse indications.*

*C. Incorrect. 4 is reading low & 7 is reading high compared to the diverse indications.*

*D. Correct. 1, 2, 5, 6 are accurate indications and diversely show that the alarm is valid.*

**K/A Statement: Ability to identify and interpret diverse indications to validate the response of another indication. (CFR: 41.7 / 43.5 / 45.4)**

Technical Reference(s): EMG ES-12, EMG E-1, TBN 01, EMG C-31 Figure 1, WC Tank Setpoint Document, LO1732322

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __7___

55.43 __5___

Comments:

Incorporated Jane comments, changed to rev. 3, 6/27/11

Answer: D

65. 2.2.41 4

One Operations off-normal procedure (OFN) requires a local operator to close EP HV-8808 series (Safety Injection Accumulator Isolation) valves by installation of a jumper from Wire 1 to Wire 21 at terminal board points 4 and 5.

What does this jumper do to the valve circuit?

*(REFERENCE PROVIDED)*

A. Deenergizes the Trip Coil allowing the 52 contact to close.

B. Jumpers the 42C/a contact energizing the 42C coil.

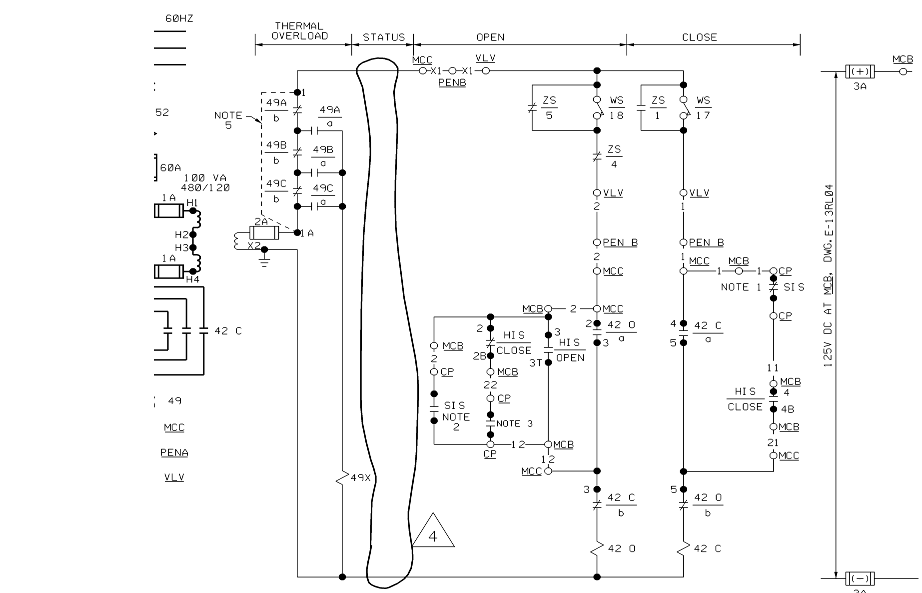
C. Deenergizes 42 O coil allowing the 42 C/b to close.

D. Jumpers the 42C line contacts.

*Justification*

*A. Incorrect, trip coil is not used in this circuit. The 52 contact allows breaker closure*
*B. Correct.*
*C. Incorrect, 42 O coil is deenergized when the valve is open by ZS 5 limit switch or the WS 18 torque switch. This opens the 42O/a contact and closes the 42/b so a jumper from wire 1 to 21 will energize the 42C close coil.*
*D. Incorrect, it jumpers the 42C/a, SIS and handswitch contacts. It does not jumper the limit switch or torque switch contacts for motor protection.*

*OFN RP-014, step 18b*
*E-13EP02A -- See attached drawing E-13EP02A (partial)*




8. TO STATUS PANEL SEE DWG. E-13SA03.
7. BREAKER SHOULD BE PADLOCKED DURING NORMAL OPERATION.
6. SEE TABLE A FOR INTERLOCK.
5. JUMPER TO BE INSTALLED PRIOR TO CORE-LOADING.
4. FOR STEM MOUNTED SWITCHES SEE DWG. E-13EP02B.

**K/A Statement: Ability to obtain and interpret station electrical and mechanical**

**drawings. (CFR: 41.10 / 45.12 / 45.13)**

Technical Reference(s): OFN RP-014, LO1732424, E-13EP02A

Proposed references to be provided to applicants during examination: E-13EP02A

Learning Objective: R3

Question Source: Bank # _18564______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _10__
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 4, 7/2/11

Answer: B

66. 2.2.43 4

A Main Control room "F" tier annunciator alarm has been alarming and resetting at a rate greater than sixteen times in an hour.

What is the proper response to this condition per AP 21-001, CONDUCT OF OPERATIONS?

A. Allow the alarm to time out, place the annunciator number on the White Board with explanation, and designate an individual to continuously monitor the alarm section with the timed out alarm.

B. Initiate a Work Request/Condition Report for the problem, make an Instrument-Out-Of-Service sticker and affix to the alarm window, then allow the alarm to time out.

C. Allow the alarm to time out, place the annunciator number on the white board with explanation, and then pull the alarm card in the RK racks to return the MCB alarms to “Black Board.”

D. Initiate an Instrument-Out-Of-Service log entry and affix a sticker to the alarm window, write a Work Request/Condition Report, and then allow the window to time out.

*Justification*

*A. Correct. Section 6.3*
*B. Incorrect, monitoring required*
*C. Incorrect, maintenance required to repair*
*D. Incorrect, all are things to do but not in this case*

**K/A Statement: Knowledge of the process used to track inoperable alarms. (CFR: 41.10 / 43.5 / 45.13)**

Technical Reference(s): AP 21-001, LO1733211

Proposed references to be provided to applicants during examination: None

Learning Objective: R4

Question Source: Bank # _46942______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___2008 DCPP_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 _10___
55.43 __5___

Comments:

Modified based on Brendan comments. Changed to Rev. 4, 6/11/11

Answer: A

67. 2.3.12 5

In accordance with AP 25A-200, ACCESS TO LOCKED HIGH OR VERY HIGH RADIATION AREAS, each Very High Radiation Area lock has a unique key which allows access to only that area.

Issuance of a key for entry into a Very High Radiation Area requires the permission of the . . .

A. HP Shift Technician ONLY

B. HP Supervisor and HP Shift Technician

C. Shift Manager and Radiation Protection Manger

D. Radiation Protection Manger and Plant Manager

*Justification*

*A. Incorrect, not complete answer*
*B. Incorrect, not complete answer*
*C. Correct, 5.2 & 5.3, 6.3.1*
*D. Incorrect, PM responsible for the process*

**K/A Statement: 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. (CFR: 41.12 / 45.9 / 45.10)**

Technical Reference(s): AP 25A-200, LO1733204

Proposed references to be provided to applicants during examination: None

Learning Objective: R4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 _12__
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 5, 7/6/11

Answer: C

68. 2.3.7 3

What posting is required for areas accessible to personnel with radiation levels greater than or equal to 1000 mr/hr at 30 cm. (12 in.), but less than 500 Rad/hr at 1 meter from the radiation source?

A. Radiation Areas

B. High Radiation Areas

C. Very High Radiation Areas

D. Locked High Radiation Areas

*Justification*

*A. Incorrect, see below*
*B. Incorrect, see below*
*C. Incorrect, see below*
*D. Correct, see below*

*AP 25A-200, Section 4.0, Step 4.5,* ***Locked High Radiation Area (LHRA)***
*4.5.1 Areas accessible to personnel with radiation levels equal to or greater than 1,000 mREM/hr at 12 in (30 cm.) from the radiation source, but less than 500 Rads at 1 meter (3.1.3).*

**K/A Statement: Ability to comply with radiation work permit requirements during normal or abnormal conditions. (CFR: 41.12 / 45.10)**

Technical Reference(s): AP 25A-200, LO1733204, AP 25A-001

Proposed references to be provided to applicants during examination: None

Learning Objective: R4

Question Source: Bank # _17523______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 _12__
55.43 _____

Comments:

Modified based on Lee/Jane comments. Changed to Rev. 2, 3/23/11

Answer: D

69. 2.4.21 1

Given the following plant conditions:

- At 100% power a main steamline break on "D" S/G occurred 1 hour ago
- SI actuated and EMG E-0, REACTOR TRIP OR SAFETY INJECTION, was entered
- The crew transitioned to EMG E-2, FAULTED STEAM GENERATOR ISOLATION, and completed all actions required by the procedure
- The crew transitioned to EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT, as required and at step 2, **Check If S/G's Are Not Faulted**, they find the following:
  - Secondary Rad Monitors - NORMAL
  - Containment pressure - 28 psig
  - RCS Cold Legs - 225°F and decreasing
  - RCS Hot Legs - 235°F and decreasing
  - RCS pressure - 1000 psig and decreasing
  - S/G "A", "B", 'C" pressures - 700 psig and stable
  - S/G "D" - 200 psig and decreasing

Which ONE of the following describes the expected crew actions?

A. Continue and complete all of EMG E-1 since all actions of EMG E-2 have already been completed.

B. Immediately transition to EMG FR-Z1, RESPONSE TO HIGH CONTAINMENT PRESSURE due to high containment pressure.

C. Immediately transition to EMG FR-P1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK due to Orange path.

D. Go to EMG E-2, FAULTED STEAM GENERATOR ISOLATION to re-perform the procedure.

*Justification*

*A. Incorrect, must exit and go to any red/orange path that exists, status trees are continuously monitored*
*B. Incorrect, FR-P series has higher priority than Z series*
*C. Correct.*
*D. Incorrect, E2 is not re-entered unless indications of an additional faulted S/G are identified*

**K/A Statement: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (CFR: 41.7 / 43.5 / 45.12)**

Technical Reference(s): EMG F-0, LO1732338, EMG FR-P1

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _18493______

Modified Bank # _______
New _______

Question History: Last NRC Exam ___2006 WC_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __7___
55.43 __5___

Comments:

Replaced question based on Brendan comments, 6/11/11

Answer: C

70. 2.4.47 2

Given the following plant conditions:

- A natural circulation cooldown is in progress using EMG ES-06, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN THE VESSEL (WITH RVLIS)
- Pressurizer level begins rising rapidly
- RVLIS indication is 68% and decreasing

Which ONE of the following describes the expected crew actions?

A. Re-pressurize the RCS until RVLIS indication is >76%.

B. Stop the cooldown and energize backup heaters to saturate the PZR.

C. Initiate SI and transition to EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT.

D. Transition to EMG FR-I3 RESPONSE TO VOIDS IN REACTOR VESSEL.

*Justification*

*A. Correct.*
*B. Incorrect, RNO to establish RCP start*
*C. Incorrect, foldout page would transition to E-0, not E-1*
*D. Incorrect, I3 sends you right back to ES, incorrect transition*

**K/A Statement: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material. (CFR: 41.10 / 43.5 / 45.12)**

Technical Reference(s): EMG ES-06, LO1732317

Proposed references to be provided to applicants during examination: None

Learning Objective: R11

Question Source: Bank # _14084______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 _10___
55.43 __5___

Comments:

Incorporated Jane comments, changed to Rev. 2 6/27/11

Answer: A

71. 2.4.9 2
Given the following plant conditions:

- The unit is currently in Mode 4
- RCS temperature is 290°F with RHR in service
- PRT level has started to rise
- RCS pressure indicates 285 psig
- Pressurizer level has started to lower in an uncontrolled manner
- Containment pressure and radiation levels are normal

Which ONE of the following describes the mitigative action required by OFN BB-031, SHUTDOWN LOCA?

A. Raise RCS pressure to reseat the RHR suction relief valve.

B. Stop the affected RHR pump(s) if pressurizer level is less than 6%.

C. Open an RWST suction to the running RHR pump to increase PZR level.

D. Place both RHR pumps in Pull-to-Lock when RCS subcooling is less than 45°F.

*Justification*

*A. Incorrect, pressure < LTOP setpoint 290°F = ~450 psig suction relief*
*B. Correct, foldout page RHR Pump Stopping Criteria*
*C. Incorrect, incorrect action for this temperature, would have to be less than 225°F to be correct. (27 RNO)*
*D. Incorrect, SP is 30°F, 45°F is the adverse SP*

**K/A Statement: Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)**

Technical Reference(s): OFN BB-031, LO1732425

Proposed references to be provided to applicants during examination: None

Learning Objective: R7

Question Source: Bank # _______
Modified Bank # _18624______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _10___
55.43 __5___

Comments:

Incorporated Jane comments, changed to Rev. 2 6/27/11

Answer: B

72. E01 EA2.2 3

Given the following plant conditions:

- The unit was initially at 100% power, normal lineup, NE01 Emergency Diesel out of service
- Reactor trip and SI have occurred
- Offsite power was lost concurrent with the trip
- All systems respond as designed
- S/G level in "D" S/G was increasing uncontrollably
- Crew initially transitioned to EMG E-3, STEAM GENERATOR TUBE RUPTURE
- Crew has determined the high "D" S/G level was due to AL HV-5, MOTOR DRIVEN AFWP DISCH HDR TO SG D ISO Valve, failure and have entered EMG ES-01, REDIAGNOSIS
- "D" S/G pressure is stable at 1010 psig

At this time:

- "B" CCW pump has just suffered a seized bearing. The pump breaker fails to trip but the upstream supply breaker (the breaker supplying the bus which supplies the pump) does trip, isolating the fault
- The running Emergency Diesel generator did **NOT** trip during the transient

Which ONE of the following is the correct **EMG** transition to make in response to the above conditions? (Assume another Operator is addressing any OFN's that apply as a result of the above conditions.)

A. Return to EMG E-3 and terminate SI in EMG E-3, STEAM GENERATOR TUBE RUPTURE.

B. Transition to EMG C-0, LOSS OF ALL AC POWER.

C. Transition to EMG E-2, FAULTED STEAM GENERATOR ISOLATION.

D. Transition to EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT.

*Justification:*

*A. Incorrect. The high level in D SG was due to the AL HV-5 failure and not a SGTR. Return to E-3 would provide no assistance in mitigating the event.*

*B. Correct. EDG's are not supplying busses NB01/02. CCW pump is a 4160V breaker (NB0206). NB02 is lost, NB01 is de-energized on LOOP.*

*C. Incorrect. No indications that a faulted SG as D SG at 1010# and stable.*

*D. Incorrect. With NB01/02 de-energized, correct procedure transition is EMG C-0.*

**K/A Statement: Ability to determine and interpret the following as they apply to the (Reactor Trip or Safety Injection Rediagnosis) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments. (CFR: 43.5 / 45.13)**

Technical Reference(s): EMG ES-01, E-13EG01C, LO1732314

Proposed references to be provided to applicants during examination: None

Learning Objective: R1/R2/R3

| | | |
|---|---|---|
| Question Source: | Bank # _______ | |
| | Modified Bank # _______ | |
| | New __X_____ | |

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

| | |
|---|---|
| Memory or Fundamental Knowledge | _____ |
| Comprehension or Analysis | __X__ |

10 CFR Part 55 Content:

55.41 _____
55.43 __5__

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | E01 EA2.1 | [3.2/4.0] | {43.5} |
| | E01 EK1.1 | [3.1/3.5] | {41.8, 10} |
| | E01 EK1.2 | [3.4/4.0] | {41.8, 10} |

Est Time: 3 min.

Modified based on Lee/Jane comments. Changed to Rev. 3, 3/23/11

Answer: B

73. E04 EA1.2 2

Given the following plant conditions

- A LOCA outside containment has occurred
- The crew is performing the actions in EMG C-12, LOCA OUTSIDE CONTAINMENT
- RCS Cooldown is **NOT** in progress

Which ONE of the following indications is used to determine if the leak has been isolated in accordance with EMG C-12?

A. RVLIS indication, because when the break is isolated, vessel head voiding will immediately be reduced.

B. Pressurizer level, because when the break is isolated, RCS inventory will rapidly rise.

C. Safety injection flow, because when the break is isolated, it is the first parameter that will change.

D. RCS pressure, because when the break is isolated, SI flow will repressurize the RCS.

*Justification*

*A. Incorrect. RVLIS may indicate 100% at the start, so may not provide indication of isolation at all*
*B. Incorrect. RCS inventory will increase, but may not immediately show up on PZR level*
*C. Incorrect. SI Flow is a good confirmatory indication when RCS pressure rises, because it will be reduced, but RCS pressure rise is the only immediate indication*
*D. Correct. RCS pressure is the primary means of determining whether the leak is isolated.*

**K/A Statement: Ability to operate and / or monitor the following as they apply to the (LOCA Outside Containment) Operating behavior characteristics of the facility (CFR: 41.7 / 45.5 / 45.6)**

Technical Reference(s): EMG C-12, LO1732333

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _59101______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___Callaway 2007_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 __7__
55.43 _____

Comments:

Other K/A E04 EA2.2

Incorporated Jane comments, changed to Rev. 2 6/27/11

Answer: D

74. E05 EK3.2 1
Which ONE of the following is the primary reason for stopping all RCP's in EMG FR-H1, RESPONSE TO LOSS OF SECONDARY HEAT SINK?

A. They are secured to prevent the heat added by the RCPs from adversely affecting indications used to determine whether or not RCS bleed and feed will be required.

B. They are secured to reduce the heat added from the RCPs, thereby delaying the need for bleed and feed and gaining time to establish a means of supplying FW to a S/G.

C. This will reduce RCS pressure enough to ensure bleed and feed is adequate for RCS cooling requirements.

D. This will establish natural circulation conditions and will tend to mitigate the loss of secondary heat sink by establishing a delta T across the core.

*Justification:*

*A. Incorrect, these indications are designed for these conditions, not a basis for pump trip.*

*B. Correct. Basis for step 7.*

*C. Incorrect, this alone will not be adequate for heat sink, this only gives and additional 20-30 minutes. Step 2 basis.*

*D. Incorrect, this is a natural outcome but not the basis for doing so.*

**K/A Statement: Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) Normal, abnormal and emergency operating procedures associated with (Loss of Secondary Heat Sink). (CFR: 41.5 / 41.10, 45.6, 45.13)**

Technical Reference(s): BD-EMG FR-H1, LO1732346, EMG FR-H1

Proposed references to be provided to applicants during examination: None

Learning Objective: R1

Question Source: Bank # _59099______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___Callaway 2007_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _5, 10_
55.43 _____

Comments:

Replaced question based on Brendan comments, 6/11/11

Answer: B

75. E11 EK3.2 5

EMG FR-Z1, RESPONSE TO HIGH CONTAINMENT PRESSURE, contains a step checking if EMG C-11, LOSS OF EMERGENCY COOLANT RECIRCULATION, is in effect, Containment Spray should be operated as directed in EMG C-11.

Which ONE of the following describes the basis for giving priority to EMG C-11 for spray operation?

EMG C-11 has stopped Containment spray pumps to . . .

A. Maintain level in the Containment sump for RHR pumps.

B. Ensure sufficient power is available from the EDGs for the RHR pumps.

C. Ensure sump pH is in the range to prevent chloride induced stress corrosion.

D. Conserve RWST level.

*Justification*

*A. Incorrect, basis for sump level*
*B. Incorrect, to prevent DG overload*
*C. Incorrect, basis for addressing sump ph if spray has not ran long enough*
*D. Correct, step 3 basis*

**K/A Statement: Knowledge of the reasons for the following responses as they apply to the (Loss of Emergency Coolant Recirculation) Normal, abnormal and emergency operating procedures associated with (Loss of Emergency Coolant Recirculation). (CFR: 41.5 / 41.10, 45.6, 45.13)**

Technical Reference(s): EMG FR-Z1 Bkgd, LO1732350, EMG FR-Z1

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 _5, 10_
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 5, 6/27/11

Answer: D

76. S 006 2.4.6 3

Given the following plant conditions:

- Safety injection pump train "A" has been tagged out for motor bearing replacement
- A Safety Injection occurs due to a Large Break LOCA inside containment
- Two hours later, the "B" SI pump fails
- All other equipment functions as designed for the duration of the accident

Which ONE of the following describes how the loss of both SI pumps affect the ability of the crew to mitigate this accident in the long term?

A. Align both trains of RHR to hot leg recirculation when required, cold leg recirculation flowpath is still available, loss of SI pumps has no long term effect.

B. Both trains of RHR will remain in injection mode during alignment per EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION.

C. Action to restore one SI pump to service must be completed prior to realignment per EMG ES-13, TRANSFER TO HOT LEG RECIRCULATION.

D. Transition to EMG ES-11, POST LOCA COOLDOWN AND DEPRESSURIZATION, will be required even if RCS pressure is less than 300 PSIG.

*Justification:*

*A. Correct.*

*B. Incorrect. SI pumps does not determine RHR alignment.*

*C. Incorrect, RHR is the long term cooling supply.*

*D. Incorrect, ES-11 entry criteria will not be met.*

**K/A Statement: Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)**

Technical Reference(s): EMG ES-13, BD-EMG ES-13, LO1732323

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _12602______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _10___
55.43 __5___

Comments:

Incorporated Jane comments, changed to rev. 3, 6/27/11

Answer: A

77. S 008 A2.05 4

Given the following plant conditions:

- The unit is at 100% power
- Instrument air is lost to BG TCV-130, LTDN HX OUTLET TEMP CTRL, valve
- Annunciator 052A, CCW TO RCP FLOW LO, actuates
- ALR 00-052A actions are performed

Which ONE of the following describes the INITIAL response of letdown temperature and CCW return flow from the letdown heat exchanger and what compensatory action would be taken?

| | Response | Compensatory Action |
|---|---|---|
| A. | Letdown temperature will increase<br><br>CCW return flow will decrease | Secure Normal letdown and place Excess Letdown in service per SYS BG-310, SECURING NORMAL LETDOWN. |
| B. | Letdown temperature will decrease<br><br>CCW return flow will increase | Secure Normal letdown and place Excess Letdown in service per SYS BG-310, SECURING NORMAL LETDOWN. |
| C. | Letdown temperature will increase<br><br>CCW return flow will decrease | Divert letdown flow to the RHUT BG LCV-112A, Divert Valve per OFN KA-019, LOSS OF INSTRUMENT AIR. |
| D. | Letdown temperature will decrease<br><br>CCW return flow will increase | Divert letdown flow to the RHUT BG LCV-112A, Divert Valve per OFN KA-019, LOSS OF INSTRUMENT AIR. |

*Justification:*

*A. Incorrect. Opposite system response, correct action. Plausible since high temperatures on a failed valve would require removing normal letdown from service.*

*B. Correct. Low temperature on demineralizers would initiate a reactivity addition; removing normal letdown from service would be the correct response.*

*C. Incorrect. Opposite system response, incorrect action. Plausible because high temperature diversion would prevent a reactivity addition or excursion, however OFN KA-019 does not direct diverting letdown flow.*

*D. Incorrect. Correct system response. Incorrect action and procedure. Plausible because low temperature diversion would prevent a reactivity addition or excursion, however OFN KA-019 does not direct diverting flow.*

**K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Effect of loss of instrument and control air on the position of the CCW valves that are air operated (CFR: 41.5 / 43.5 / 45.3 / 45.13)**

Technical Reference(s): OFN KA-019, ALR 00-052A, SYS BG-310, M-12BG02, SYS BG-

208, LO1732429, AP 21-001 Step 6.1.3

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5___
55.43 __5___

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 026 AA1.07 | [2.9/3.0] | {41.7} |
| | 008 G2.4.11 | [4.0/4.2] | {41.10, 43.5} |

Est Time: 3 min

Modified based on Brendan comments. Changed to Rev. 4, 6/11/11

Answer: B

78. S 010 A2.03 6

A Pressurizer PORV is leaking by the seat to the PRT at a rate of 1 gpm. All other system components are normal.

Which ONE of the following describes the Technical Specification Limiting Condition of Operation (LCO) Required Actions and procedure entry requirements to mitigate?

A. LCO 3.4.11 - Pressurizer Power Operated Relief Valves (PORVs), Conditions A - One or more PORVs inoperable and capable of being manually cycled.

   OFN BB-007, RCS LEAKAGE HIGH

B. LCO 3.4.11 - Pressurizer Power Operated Relief Valves (PORVs), Conditions A - One or more PORVs inoperable and capable of being manually cycled.

   OFN MA-038, RAPID PLANT SHUTDOWN

C. LCO 3.4.13 - RCS Operational LEAKAGE, Conditions B - Pressure boundary LEAKAGE exists, that requires shutdown

   OFN MA-038, RAPID PLANT SHUTDOWN

D. LCO 3.4.13 - RCS Operational LEAKAGE, Conditions B - Pressure boundary LEAKAGE exists, no shutdown required

   OFN BB-007, RCS LEAKAGE HIGH

*Justification*

*A. Correct. LCO, Action, procedure to mitigate*
*B. Incorrect, PORV is inop, within limits no SD required, incorrect procedure*
*C. Incorrect, right leakage, no SD required, incorrect procedure, < 10 gpm*
*D. Incorrect, wrong leakage, right action, right procedure, < 10 gpm*

**K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: PORV failures (CFR: 41.5 / 43.5 / 45.3 / 45.13)**

Technical Reference(s): TS 3.4.13, TS Definitions, SY1300200, LO1732417, OFN BB-007, TS 3.4.11

Proposed references to be provided to applicants during examination: None

Learning Objective: R8

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __5___
55.43 __5___

Comments:

Incorporated Jane comments, changed to Rev. 6, 6/27/11

Answer: A

79. S 029 EA2.02 5
Given the following plant conditions:

- Following a load rejection from 100% to 60% power, the crew is attempting to stabilize the plant
- Pressurizer pressure spiked to approximately 2395 psig and is now dropping rapidly
- The RO reports that a 'PZR PRESS HI RX TRIP' first out annunciator is lit
- Indications exist that the Pressurizer PORVs have opened
- The reactor and turbine remain on-line

Which ONE of the following identifies the correct INITIAL response by the CRS?

A. Enter LCO 3.3.1, Table 3.3.1-1 for Reactor Protection System.

B. Trip the reactor, enter EMG E-0, REACTOR TRIP OR SAFETY INJECTION.

C. Trip the reactor, enter EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS.

D. Enter LCO 3.3.2, Table 3.3.2-1 for ESF Actuation Logic and Relays.

*Justification*

*A. Incorrect. Trip setpoint on PZR pressure was exceeded, LCO table 3.3.1-1, FU 8b, Mode 1 & 2, Unit should be in Mode 3.*
*B. Correct*
*C. Incorrect. If the reactor trips, EMG E-0 entered first, if reactor does not trip then enter EMG FR-S1*
*D. Incorrect. LCO 3.3.2, Table 3.3.2-1 - no high pressure function only Low, will be done in E-0*

**K/A Statement: Ability to determine or interpret the following as they apply to a ATWS: Reactor trip alarm (CFR 43.5 / 45.13)**

Technical Reference(s): EMG E-0, TS 3.3.1, TS 3.3.2, AP 15C-003, SY1406500, LO1732313

Proposed references to be provided to applicants during examination: None

Learning Objective: R1

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _____
55.43 __5__

Comments:

Modified based on Brendan comments. Changed to Rev. 5, 6/11/11

Answer: B

80. S 033 2.2.25 5

Given the following plant conditions:

- Normal Reactor start up in progress
- Power is 3% RTP
- Intermediate Range Channel NI36 is INOPERABLE
- Maintenance has determined it will take at least three hours to correct

Which ONE of the following describes the CRS decision, Technical Specification action, and the basis for that action?

A. Increase power to > P-10 within 24 hours.

Ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition

B. Maintain 3% RTP until NI36 is corrected.

Ensures that protection is provided for multiple rod drop accidents

C. Maintain between 5% and 10% RTP until NI36 is corrected.

Ensures that protection is provided against rapid increases in neutron flux that are characteristic of an RCCA drive rod housing rupture

D. Startup increase may continue without restriction or time limit.

Provides protection for control rod withdrawal from subcritical and control rod ejection events.

*Justification*

*A. Correct. 3.3.1 Action F*
*B. Incorrect, wrong TS action, Neg rate basis, wrong basis*
*C. Incorrect TS action, High positive rate basis, wrong basis*
*D. Incorrect, wrong TS action, SR basis, wrong basis, 24 hr time limit to be above P-10*

**K/A Statement: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. (CFR: 41.5 / 41.7 / 43.2)**

Technical Reference(s): TS, TS Basis, SY1301501

Proposed references to be provided to applicants during examination: None

Learning Objective: R13

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 _5, 7__
55.43 __2___

Comments:

Modified based on Jane comments. Changed to Rev. 5, 7/6/11

Answer: A

81. S 045 A2.17 3

Given the following plant conditions:

- The unit is at 45% power
- While conducting STS AC-001, MAIN TURBINE VALVE CYCLE TEST, during the performance of step B.1.2, the Operator presses and holds the CIV-2 TEST pushbutton
- TURB STOP VLV2 bistable light is LIT
- Upon releasing the CIV-2 TEST pushbutton the test solenoids fail to de-energize

The CIV-2 and ISV are ___1____ and you would direct an Operator action to ____2_____ and enter procedure ____3_____ .

| | 1. Valve Position | 2. Operator Action | 3. Procedure in Effect |
|---|---|---|---|
| A. | Closed | trip the reactor | EMG E-0, REACTOR TRIP OR SAFETY INJECTION |
| B. | Closed | evaluate TR 3.3.14 Turbine Overspeed Protection | GEN 00-004, POWER OPERATION |
| C. | Open | reduce turbine load to 30% | OFN MA-038, RAPID PLANT SHUTDOWN |
| D. | Open | reduce turbine load to 40% | ALR 00-083C, RX PARTIAL TRIP |

*Justification*

*A. Incorrect, only if trip criteria met, not under these conditions*
*B. Correct.*
*C. Incorrect, valves remain closed*
*D. Incorrect, valves remain closed.*

**K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operation on the MT/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Malfunction of electrohydraulic control (CFR: 41.5 / 43.5 / 45.3 / 45.5)**

Technical Reference(s): STS AC-001, TR 3.3.14, GEN 00-004, SY1504600

Proposed references to be provided to applicants during examination: None

Learning Objective: R8

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __5___
55.43 __5___

Comments:

Modified based on Lee/Jane comments. Changed to Rev. 3, 3/23/11

Answer: B

82. S 056 AA2.03 4

Given the following plant conditions:

- Preparations are being made to establish charging flow in EMG ES-03, SI TERMINATION, when offsite power is lost
- The Emergency Diesel Generators start and power both safety buses
- Fifteen seconds later the STA observes SI Pumps are NOT running
- SI pumps were running before loss of offsite power

Should SI pumps restart automatically by this point in time and what procedural action is directed by the CRS?

A. Yes, the LOCA Sequencers should have started the SI pumps 10 seconds ago.

Direct the crew to manually start the SI pumps.

B. Yes, the Shutdown Sequencer should have started the SI pumps 10 seconds ago.

Direct the crew to manually start the SI pumps.

C. No, the LOCA Sequencer did not actuate because the SI signal has been reset.

Direct the crew to manually start the SI pumps after the S/D sequencer has timed out.

D. No, the LOCA Sequencer will not start the SI pumps for another 10 seconds.

Direct the crew to monitor the pumps and start them if the sequencer does not.

*Justification*

*A. Incorrect, the LOCA seq was not actuated because SI was reset and SS sequencer was actuated by LOOP*
*B. Incorrect, the SS does not start SI pumps*
*C. Correct. Crew should restart the pumps until procedurally directed to secure them*
*D. Incorrect, the LOCA seq was not actuated because SI was reset*

*SI reset caution prior to step 1. SI is reset in step 1, Charging is adjusted in steps 4-6, 10-14*
*SI Pumps stopped at step 15*

**K/A Statement: Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Operational status of safety injection pump (CFR: 43.5 / 45.13)**

Technical Reference(s): BD-EMG ES-03, EMG ES-03, E-12NF01, SY1406401, LO1732316

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _18031______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 _____

55.43 __5__

Comments:

Modified based on Brendan comments. Changed to Rev. 4, 6/11/11.

I would expect the SRO to direct crew actions since it has been a while since SI reset and the changing plant conditions. I would not expect the board operators to do this on their own, especially initial licensed operators.

Answer: C

83. S 057 2.4.8 5

Given the following plant conditions:

- A Reactor startup is in progress
- Source range channels NI31 and NI32 indicate $10^4$ cps
- Intermediate range channels NI35 and NI36 indicate 5 $X10^{-11}$ amps
- Annunciator 025A, NN01 INST BUS UV, has just alarmed

Which ONE of the following describes the actions and identifies the required implementation of procedures for this event?

A. Commence a reactor shutdown to insert all control banks, AND Isolate Instrument Inverter NN11.

Implement OFN NN-021, LOSS OF VITAL 125 VAC INSTRUMENT BUS, and refer to GEN 00-003, HOT STANDBY TO MINIMUM LOAD, as necessary.

B. Verify reactor trip, AND Restore power to NN01 from alternate AC power source.

Implement EMG E-0, REACTOR TRIP OR SAFETY INJECTION, and have an Operator perform OFN NN-021, LOSS OF VITAL 125 VAC INSTRUMENT BUS.

C. Commence a reactor shutdown to insert all control banks, AND Restore power to NN01 from alternate AC power source.

Implement OFN MA-038, RAPID PLANT SHUTDOWN, and have an Operator perform OFN NN-021, LOSS OF VITAL 125 VAC INSTRUMENT BUS.

D. Verify reactor trip, AND Isolate Instrument Inverter NN11.

Implement EMG E-0, REACTOR TRIP OR SAFETY INJECTION, then transition to OFN NN-021, LOSS OF VITAL 125 VAC INSTRUMENT BUS.

*Justification*

*A. Incorrect, reactor has tripped, wrong procedures for plant conditions*
*B. Correct, reactor has tripped, plant will need to be stabilized using E-0, plant components will have to be realigned with OFN, AP 15C-003 providing guidance for branching*
*C. Incorrect, reactor has tripped, wrong procedure for plant conditions*
*D. Incorrect, reactor has tripped, plant components using OFN. EMG E-0 does not allow transition to OFN*

*AP 15C-003, Section 6.10, details guidance for referring to a procedure branching and transitioning (CRS knowledge and supervisory activities)*

**K/A Statement: Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (CFR: 41.10 / 43.5 / 45.13)**

Technical Reference(s): ALR 00-025A, OFN NN-021, EMG E-0, AP 15C-003, M-744-00019, M-744-00020, E-13SE01, E-13SE02, E-13NN01, OFN MA-038, GEN 00-003, LO1732103, LO1733203, SY1301501, LO1732313, LO1732431

Proposed references to be provided to applicants during examination: None

Learning Objective: R18

Question Source: Bank # _45815______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _10___
55.43 __5___

Comments:

Other K/A: 057 AK3.01

Modified based on Brendan comments. Changed to Rev. 5, 6/11/11

Answer: B

84. S 058 2.4.3 6

Given the following plant conditions:

- The plant is at 100% power
- RCS Wide Range pressure channel BB PI-405 is out of service
- BB PT-403 loses power

Based on these conditions, what (if any) LCO's are affected and what actions are appropriate?

*(REFERENCE PROVIDED)*

A. BB PT-403 is a post-accident instrument. In accordance with TS Table TS 3.3.3-1 for RCS WR pressure indication, a 7-day LCO is entered to restore the channel to OPERABLE.

B. BB PT-403 is a non-qualified instrument, and therefore is NOT covered in Technical Specifications, write a Condition Report to repair.

C. BB PT-403 is a post-accident instrument. NO LCO is entered since BB PT-403 does NOT have an input to any required accident monitoring functional unit, write a Condition Report to repair.

D. BB PT-403 provides a safeguards actuation input. In accordance with TS Table 3.3.2-1 for RCS WR Pressure indication, 72 hours is allowed to place the associated Safety Injection actuation bistables in TRIP or be in MODE 3 in 78 hours, and be in MODE 4 in 84 hours.

*Justification*

*A. Correct. Instrument/Safety function identified, correct TS and actions*
*B. Incorrect, PT-403 is a post-accident qualified instrument. Incorrect TS application*
*C. Incorrect, PT-403 is a post-accident qualified instrument. Incorrect TS application.*
*D. Incorrect, Wide range pressure instruments do provide a safeguards input, LTOP. Incorrect TS application*

*BB PT-403 is powered from NN02 (NK02), BB PT-406 are powered from NN04, Condition A for inop PT-405, Cond C for 2 inop PT-403/405 - restore 1 within 7 days*

**K/A Statement: Ability to identify post-accident instrumentation. (CFR: 41.6 / 45.4)**

Technical Reference(s): TS 3.3.3, SY1300202, M-12BB04, E-13BB15, M-761-00043, M-761-00101, OFN SB-008 Att. S

Proposed references to be provided to applicants during examination: Table 3.3.3-1, Table 3.3.2-1

Learning Objective: R1

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 __6__
55.43 _____

Comments:

Modified based on Jane comments. Changed to Rev. 6, 6/22/11

Answer: A

85. S 062 2.1.25 6

Given the following plant conditions:

- The unit is operating at 80%
- Generator power is 1050 Megawatts
- Annunciator 00-130E, GEN AUX TROUBLE, is in alarm
- ALR 408-06A, MACH GAS PRESSURE HIGH-LOW, is in alarm
- CC PI-1, MACHINE GAS PRESSURE, reads 41 psig
- Reactive Load is outgoing at 200 MVA
- Minor leakage from the Main Generator housing is reported

Which ONE of the following is the minimum hydrogen pressure needed to ensure the Generator has enough cooling (assume hydrogen cooling aligned normal) and what actions is the CRS to direct?

*(REFERENCE PROVIDED)*

A. 75 psig for power factors of 0.7 and higher

If leakage cannot be isolated, trip the unit and emergency depressurize the Main Generator using SYS CC-321, GENERATOR HYDROGEN EMERGENCY DEPRESSURIZATION

B. 60 psig for power factors of 0.8 and higher

Isolate the leak in accordance with OFN AF-025, UNIT LIMITATIONS

C. 48 psig for power factors of 0.85 and higher

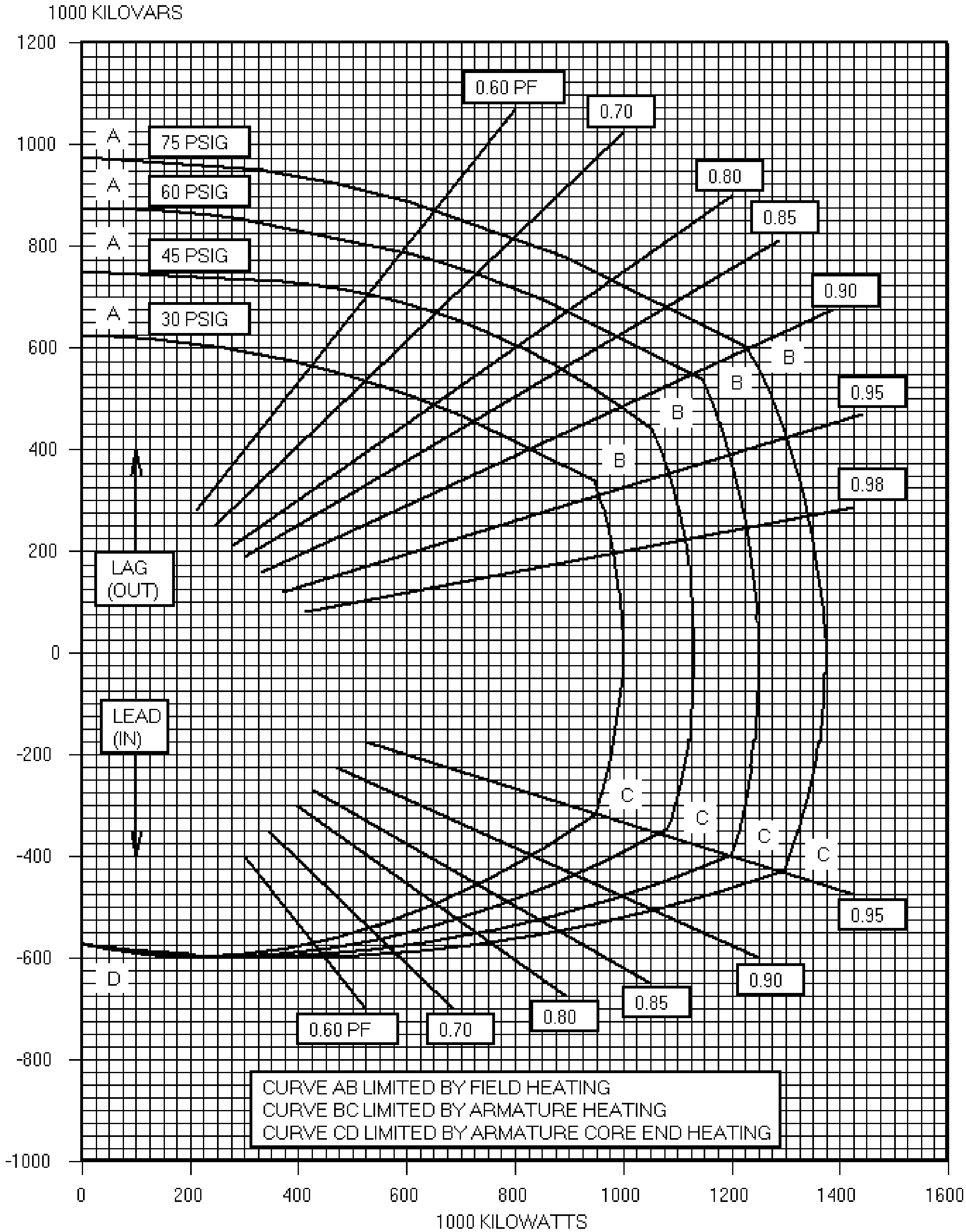
Isolate the leak in accordance with OFN AF-025, UNIT LIMITATIONS

D. 45 psig for power factors of 0.95 and higher

If leakage cannot be isolated, trip the unit and emergency depressurize the Main Generator using SYS CC-321, GENERATOR HYDROGEN EMERGENCY DEPRESSURIZATION

*Justification*

*A. Incorrect, would be outside curve, correct procedural direction*
*B. Incorrect, would be outside curve, incorrect procedural action, leak is isolated IAW ALR 408*
*C. Incorrect, do not interpolate curves, incorrect procedural action, leak is isolated IAW ALR 408*
*D. Correct. ALR 408, Att. P step P4 RNO*




**K/A Statement: Ability to interpret reference materials, such as graphs, curves, tables, etc. (CFR: 41.10 / 43.5 / 45.12)**

Technical Reference(s): OFN AF-025, Figure 1, ALR 408 Att. P, SYS CC-321, LO1732435, SY1502300, SY1504502

Proposed references to be provided to applicants during examination: Figure 1

Learning Objective: R2/R9/R7

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _10___
55.43 __5___

Comments:

Modified based on Jane comments. Changed to Rev. 6, 6/22/11

Answer: D

86. S 064 A2.06 7

Given the following plant conditions:

- The unit is in MODE 4
- NE01 D/G is in a post maintenance run
- It ran for 12 hours at 1.15 MW
- Maintenance has requested that you secure the D/G

Which ONE of the following describes 1) the impact on the EDG and 2) the required action?

A. 1) Oil will buildup in the exhaust

2) Increase load on NE01 to half load for 1 hour then full load prior to securing the D/G IAW SYS KJ-123, POST MAINTENANCE RUN OF EMERGENCY DIESEL GENERATOR A

B. 1) Crankcase pressure will go positive

2) Increase load on NE01 to half load for 1 hour then full load prior to securing the D/G IAW SYS KJ-123, POST MAINTENANCE RUN OF EMERGENCY DIESEL GENERATOR A

C. 1) Oil will buildup in the exhaust

2) Decrease load and secure the D/G as requested IAW SYS KJ-123, POST MAINTENANCE RUN OF EMERGENCY DIESEL GENERATOR A

D. 1) Crankcase pressure will go positive

2) Decrease load and secure the D/G as requested IAW SYS KJ-123, POST MAINTENANCE RUN OF EMERGENCY DIESEL GENERATOR A

*Justification*

A. *Correct, SYS KJ-123 P&L 4.4*
B. *Incorrect, During engine operation, a portion of the combustion air is used to drive an ejector. The ejector is designed to maintain a negative pressure in the crankcase.*
C. *Incorrect, first part correct, wrong action, right procedure*
D. *Incorrect, During engine operation, a portion of the combustion air is used to drive an ejector. The ejector is designed to maintain a negative pressure in the crankcase. wrong action, right procedure.*

*The Diesel Generator should not be operated at loads less than 20% (1.25 MW) for greater than 10 hours to minimize buildup of oil in the exhaust. If the engine has been ran for an extended amount of time at low load, the engine should be slowly loaded approximately 400 kW per minute, to half load (3 MW) and held there for one hour then loaded to full load.*

**K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Operating unloaded, lightly loaded, and highly loaded time limit (CFR: 41.5 / 43.5 / 45.3 / 45.13)**

Technical Reference(s): SY1406400, SYS KJ-123

Proposed references to be provided to applicants during examination: None

Learning Objective: R8

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5___
55.43 __5___

Comments:

Incorporated Lee comments. Changed to Rev. 7, 6/28/11.

Assess plant conditions, then select the procedure to mitigate or recover - SRO Only

Answer: A

87. S 065 AA2.01 5

Given the following plant conditions:

- Reactor power 65% stable
- RCS pressure 1965 psig stable
- RCS temperature 576°F stable
- Instrument Air header pressure 85 psig decreasing (1# every 5 mins)
- Annunciator 091A, INST AIR DRYER PRESS LO, is LIT
- Annunciator 092A, COMPRESS AIR PRESS LO, is LIT

Which ONE of the following identifies the required action(s) and implementation of procedures for this event?

A. Attempt to identify and isolate the instrument air system leakage

Implement OFN KA-019, LOSS OF INSTRUMENT AIR

B. Initiate SI

Implement EMG E-0, REACTOR TRIP OR SAFETY INJECTION

C. Trip the Reactor

Implement EMG E-0, REACTOR TRIP OR SAFETY INJECTION

D. Perform a shutdown per OFN MA-038, RAPID PLANT SHUTDOWN

Refer to OFN KA-019, LOSS OF INSTRUMENT AIR, to identify and isolate the leak

*Justification*

*A. Correct, step 6 RNO, correct action and procedure implementation*

*B. Incorrect, air pressure above 70 psig, Initiate SI is not performed in OFN. Incorrect action, incorrect procedure implementation*

*C. Incorrect, air pressure above 70 psig, will eventually get there if correct actions not done.Incorrect action, incorrect procedure implementation*

*D. Incorrect, Incorrect action, correct procedure implementation*

**K/A Statement: Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Cause and effect of low-pressure instrument air alarm (CFR: 43.5 / 45.13)**

Technical Reference(s): OFN KA-019, EMG E-0, OFN MA-038, SY1407800, LO1732429

Proposed references to be provided to applicants during examination: None

Learning Objective: R2/R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 ______
55.43 __5__

Comments:

Modified based on Brendan comments. Changed to Rev. 5, 6/12/11

Answer: A

88. S 068 2.1.20 6

During a release of Waste Monitor Tank (WMT), with the release in progress, HB RE-18, Liquid Radwaste Discharge monitor becomes inoperable.

What are the required actions to be taken?

A. Release in progress may continue up to 14 days with the current release permit and take actions for HB RE-18 being INOPERABLE.

B. Terminate the release, have Chemistry reanalyze samples taken of the WMT, and update the release permit, and then recommence the release.

C. Release in progress may continue up to 30 days with the current release permit and take actions for HB RE-18 being INOPERABLE.

D. Terminate the release, request Chemistry perform a new analysis, issue a new permit and verify the release path, then recommence the release.

*Justification*

*A. Incorrect, samples must be taken and analyzed*
*B. Incorrect, results must be verified by qualified people*
*C. Incorrect, samples must be taken and reviewed before continuing*
*D. Correct, see below*

*All plant releases are monitored for radioactive content. Discharges from the Waste Monitor Tanks are monitored by effluent radiation monitor HB RE-18 (located in the southeast portion of the 1976' level of the Radwaste Building). Detection of high level of radioactivity (Main Control Board alarm Process Rad HiHi will actuate) will cause HB RV-18 to close, automatically terminating a release.* ***.*** *The RM 80 for HB RE-18 is powered from non-safety 480 VAC MCC, PG17L.*

*ODCM, Action 31*
*Action 31 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 14 days provided that prior to initiating a release:*

*a. At least two independent samples are analyzed in accordance with Section 2.1.2, and*

*b. At least two technically qualified members of the facility staff independently verify the release rate calculations and discharge line valving.*

*Otherwise, suspend release of radioactive effluents via this pathway.*

*Samples shall be taken at the initiation of effluent flow and at least once per 24 hours thereafter while the release is occurring. To be representative of the liquid effluent, the sample volume shall be proportioned to the effluent stream discharge volume. The ratio of sample volume to effluent discharge volume shall be maintained constant for all samples taken for the composite sample.*

***2.4.1.2*** *With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 2-2. Restore the inoperable instrumentation to OPERABLE status within the time specified in the ACTION, or explain in the next annual Radioactive Effluent Release Report, why this inoperability was not corrected within the time specified.*

**K/A Statement: Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)**

Technical Reference(s): AP 07B-003, ALR 00-061C, LO1732420, LO1733209, Table 2-2 Action

31, AP 07B-003, AP 07B-001

Proposed references to be provided to applicants during examination: None

Learning Objective: R7/R4

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 _10___
55.43 __5___

Comments:

Modified based on Jane comments. Changed to Rev. 6, 7/2/11

Answer: D

89. S 074 EA2.01 8

Given the following plant conditions:

- The unit has tripped from 100% power due to a Small Break Loss of Coolant Accident
- Pressurizer pressure is 1535 psig
- S/G pressure are 1000 psig
- CETCs indicate 722°F
- RVLIS Natural Circulation Range indicates 42%
- The crew is currently in EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

Which ONE of the following describes the amount of superheat above saturation and what is the required procedure implementation path?

A. 122°F

Transition to EMG FR-C2, RESPONSE TO DEGRADED CORE COOLING

B. 177°F

Transition to EMG FR-C1, RESPONSE TO INADEQUATE CORE COOLING

C. 177°F

Transition to EMG FR-C2, RESPONSE TO DEGRADED CORE COOLING

D. 122°F

Transition to EMG FR-C1, RESPONSE TO INADEQUATE CORE COOLING

*Justification:*

*A. Incorrect, wrong amount of superheat (used 722-600 = 122F superheat). C1 is the required procedure to implement, may select because CETC are < 1200F*

*B. Incorrect. 177 is using S/G pressures, F-0 being monitored should transition to C1*

*C. Incorrect. 177 is using S/G pressures, C1 is the required procedure to implement may select because CETC are < 1200F.*

*D. Correct. (used 722°F-600 = 122). Correct procedure.*

*Sat. temp for 1550 psia (1535 psig) = 600F*

**K/A Statement: Ability to determine or interpret the following as they apply to a Inadequate Core Cooling: Subcooling margin (CFR 43.5 / 45.13)**

Technical Reference(s): Steam Tables, BD-EMG F-0, EMG F-0, EMG FR-C1, LO1732341

Proposed references to be provided to applicants during examination: Steam Tables

Learning Objective: R2

Question Source: Bank # _______

Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _____
55.43 __5__

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 074 EA1.13 | [4.3/4.6] | {41.7} |
| | 193003 K1.17 | [3.0/3.2] | {41.14} |
| | 193003 K1.25 | [3.3/3.4] | {41.14} |

Est Time: 5 min.

Modified based on Jane comments. Changed to Rev. 7, 6/22/11

Answer: D

90. S 079 A2.01 5

Given the following plant conditions:

- Reactor is at 100% RTP
- A leak is in progress on the Service Air System
- KA PI-40, INST AIR DRYER DISCH PRESS, is decreasing slowly

Which ONE of the following describes the impact of continued pressure loss and the procedural actions required to mitigate these conditions?

| | **Impact** | **Actions & Procedure** |
|---|---|---|
| A. | At 118 psig, verify Lead Air Compressor is fully loaded. | Ensure Instrument/Service air header pressure stable, locate and isolate leak. Implement OFN KA-019, LOSS OF INSTRUMENT AIR. |
| B. | At 110 psig, Service Air Supply Valve KA PV-11 isolates. | Ensure Instrument air header pressure rising; locate and isolate leak, direct opening of Service Air Isolation Valve per OFN KA-019, LOSS OF INSTRUMENT AIR. |
| C. | At 90 psig, the 1st Standby Air Compressor starts. | Ensure Instrument air header pressure rising; locate and isolate leak, direct opening of Service Air Isolation Valve per ALR 00-092A, COMPRESS AIR PRESS LO. |
| D. | At 70 psig, the 2nd Standby Air Compressor starts. | Ensure Instrument/Service air pressure rising; locate and isolate leak, restore Instrument air pressure to normal, reopen Containment isolation valve KA FV-29 per ALR 00-091A, INST AIR DRYER PRESS LO. |

*Justification:*

A. *Incorrect. Lead Compressor starts at 116 psig. Service air pressure is not evaluated*

B. *Correct. Service air isolates at 110 psig. Correct procedure*

C. *Incorrect. 90 psig is when B/U Nitrogen is applied. All 3 instrument air compressors are running and fully loaded at 90#, incorrect procedure.*

D. *Incorrect. 70 psig is where AOV's start to fail. All 3 instrument air compressors are running and fully loaded at 70#, KA-PV-11 closes at 110#, isolating the leak. Pressure should recover, incorrect procedure. Service air pressure is not evaluated.*

***KA PV-11*** *will close when service air pressure drops to 110 psig, or on a loss of air. The isolation valve has a bypass valve,* ***KAV-005****, around it to re-pressurize the service air header. To provide manual operation capability,* ***KA PV-11*** *also has a manual hand wheel so that it may be re-opened when the service air header is re-pressurized above 110 psig*

**K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the SAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Cross-connection with IAS (CFR: 41.5 / 43.5 / 45.3 / 45.13)**

Technical Reference(s): OFN KA-019, ALR 00-091A, ALR 00-092A, LO1732429, SY1407800

Proposed references to be provided to applicants during examination: None

Learning Objective: R2/R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 __5___
55.43 __5___

Comments:

Other K/A: 079 K1.01 [3.0/3.1] {41.4, 5, 7}

Est. Time: 3 min.

Similar topic due to same system affected, testing different knowledge and at SRO level. Incorporated Brendan comments, changed to Rev. 5, 6/15/11

Answer: B

91. S 2.1.35 4
Given the following plant conditions:

- The unit is in MODE 6
- Fuel is being off-loaded from the core
- Refueling canal boron concentration is 2230 ppm
- Both Source Range indications are in operation with 2 visual and 1 audio indication
- The Reactor has been subcritical for 186 hours
- A maintenance worker is stationed at the personnel air lock
- The equipment hatch is closed and held in place with 6 bolts
- 2 air hoses are run through the Emergency Escape hatch airlock doors with quick disconnects at the airlock doors with a person stationed for Admin controls
- The Reactor vessel water level is 24 feet 6 inches above the top of the reactor vessel flange

Which ONE of the following LCOs, if any, would pertain to the given plant conditions?

A. No LCOs should be entered

B. LCO 3.9.1 (Boron Concentration) should be entered

C. LCO 3.9.3 (Nuclear Instrumentation) should be entered

D. LCO 3.9.4 (Containment Penetrations) should be entered

*Justification*

*A. Incorrect, see below*
*B. Correct, boron < 2300 ppm*
*C. Incorrect, both SR instruments are operable*
*D. Incorrect, LCO requirements are met*

*COLR*
*2.11 <u>Boron Concentration</u> (LCO 3.9.1) The refueling boron concentration shall be greater than or equal to 2300 PPM.*

*4.35 The reactor shall be determined to have been subcritical for at least 76 hours by verification of the date and time of subcriticality prior to movement of irradiated fuel in the reactor vessel. With the reactor subcritical for less than 76 hours, suspend all operations involving movement of irradiated fuel in the reactor vessel. (3.1.15)*

*PIR 2005-2672, Time To Offload*

**K/A Statement: Knowledge of the fuel-handling responsibilities of SROs. (CFR: 41.10 / 43.7)**

Technical Reference(s): TS, GEN 00-009, COLR, LO1732109

Proposed references to be provided to applicants during examination: None

Learning Objective: R3/R5

Question Source: Bank # _______

Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _X__
Comprehension or Analysis ____

10 CFR Part 55 Content:
55.41 _10___
55.43 __7___

Comments:

Modified based on Brendan comments. Changed to Rev. 4, 6/13/11

Answer: B

92. S 2.1.4 4

Given the following plant conditions:

- The plant is in MODE 4
- The License crew on watch is at MINIMUM manning
- The RO becomes seriously ill and must be taken to the hospital
- There are three hours left until shift change

Which ONE of the following describes the required actions?

A. The affected operator must not be allowed to leave site until a relief operator arrives.

B. Shift turnover occurs before action is required. Action should be made to find a replacement, but is not required.

C. Immediate action must be taken to obtain a replacement operator within two hours.

D. Immediate action must be taken to obtain a replacement operator within four hours.

*Justification*

*A. Incorrect, must leave, must be replaced within 2 hours, FFD requirements apply*
*B. Incorrect, turnover is not allowed with an unmanned position relief must arrive within 2 hours*
*C. Correct. AP requires that immediate action be taken to find a replacement. The position cannot remain unmanned for greater than 2 hours. In M 4, 2 ROs are required to be present in the control room.*
*D. Incorrect, must be filled in 2 hours*

*6.9.2 The Shift Crew Composition may be one less than the minimum requirements of ATTACHMENT A, MINIMUM SHIFT CREW COMPOSITION for a period of time not to exceed two hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the Shift Crew Composition to within the minimum requirements.*
*1. This provision does not permit any shift crew position to be unmanned upon shift change due to an on-coming shift crew member being late or absent.*

**K/A Statement: Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc. (CFR: 41.10 / 43.2)**

Technical Reference(s): TS 5.2.2, AP 21-003 (6.8 & Att. A), LO1733203

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X_
Comprehension or Analysis ____

10 CFR Part 55 Content:

55.41 _10___
55.43 __2___

Comments:

Modified based on Brendan comments. Changed to Rev. 4, 6/13/11

Answer: C

93. S 2.2.38 3

Conditions have been entered for a LCO while in MODE 1. The Required Actions specify the unit shall be in MODE 3 in 6 hours.

Two Surveillance Requirements for LCOs not applicable in MODE 1, but necessary for LCO compliance in MODE 3, cannot be satisfied within the 6 hour completion time. These two surveillances are also outside their specified frequency.

What is the appropriate application of TS concerning entry into MODE 3?

A. Entry into MODE 3 is permitted. The affected LCOs are not required to be declared not met if the unit proceeds to MODE 5 as required by LCO 3.0.3.

B. Entry into MODE 3 is permitted. The affected LCOs must be declared not met and the Required Actions must be entered upon entry into MODE 3.

C. Entry into MODE 3 is NOT permitted. When the 6 hour completion time expires, then LCO 3.0.3 is entered which permits entering MODE 3 with no further action.

D. Entry into MODE 5 is NOT permitted. The surveillances must be completed and the MODE 3 LCOs must be met prior to entering the MODE of Applicability.

*Justification*

*A. Incorrect, first part correct, LCO's are required to be entered*
*B. Correct. See below.*
*C. Incorrect, Mode 3 is permitted, no delay*
*D. Incorrect, Mode 3 is permitted, LCO's must be declared*

*LCO 3.0.4 and SR 3.0.4 provide an exception for conditions required to comply with ACTIONS. The surveillances will still require performance when they become applicable in the MODE, but the MODE change can be made. The LCO must be declared not met and the Required Actions must be entered when MODE 3 is entered*

**K/A Statement: Knowledge of conditions and limitations in the facility license. (CFR: 41.7 / 41.10 / 43.1 / 45.13)**

Technical Reference(s): TS 3.0.4, LO1732700

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _12544______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _7, 10_
55.43 __1___

Comments:

Modified based on Lee/Jane comments. Changed to Rev. 3, 3/23/11

Answer: B

94. S 2.3.13 3

What are the Shift Manager's responsibilities for ensuring safety when radiography occurs in the protected area?

A. Ensure plant wide announcements are made on the Gaitronics.

B. Verify radiography license and procedure requirements are met.

C. Contact the Health Physics Shift Technician just prior to start.

D. Ensure boundaries are set up in accordance with 29CFR1910, OCCUPATIONAL SAFETY AND HEALTH STANDARDS.

*Justification*

*A. Correct, see below*
*B. Incorrect, Radiographer function*
*C. Incorrect, although probably done, not a SM responsibility*
*D. Incorrect, Radiographer function*

*AP 25B-200*
*5.4 Shift Manager*
*5.4.1 Ensure an announcement is made on the Gaitronics stating the specific location and time radiography will commence, AND for unauthorized personnel to evacuate and stay clear of the area. [Commitment Step 3.2.1]*
*5.4.2 Ensure an announcement is made on the Gaitronics when commencing, moving the radiological boundaries OR when radiography is complete and normal access has been restored to the area.*

**K/A Statement: Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 41.12 / 43.4 / 45.9 / 45.10)**

Technical Reference(s): AP 25B-200 (section 5.4), LO1733204

Proposed references to be provided to applicants during examination: None

Learning Objective: R5

Question Source: Bank # _17522______
Modified Bank # _______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge __X__
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 _12___
55.43 __4___

Comments:

Incorporated Brendan comments, changed to Rev. 3, 6/13/11

Answer: A

95. S 2.3.5 5
Given the following plant conditions:

- The unit is at 90% power

| **Time** | **Event** |
|---|---|
| 0 | Loop "C" MSIV fails **CLOSED** |
| 15 seconds | Reactor trip |
| 19 seconds | Feedwater Isolation occurs |
| 4.0 minutes | A Steam Generator ruptures |

Which ONE of the following describes the method of determining the affected S/G, appropriate Operator action and the procedure selected by the CRS?

A.
- SJ RE-02, SGBD Sampling
- Reset FWI signal to allow sampling
- EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

B.
- BM RE-25, SGBD Process
- Reset FWI signal to allow sampling
- EMG E-3, STEAM GENERATOR TUBE RUPTURE

C.
- GE RE-92, Condenser Air Removal Discharge
- Isolate all Feedwater flow to affected S/G
- EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

D.
- Main steam line readings taken by Health Physics
- Isolate all Feedwater flow to affected S/G
- EMG E-3, STEAM GENERATOR TUBE RUPTURE

*JUSTIFICATION:*

*A. Incorrect. Steam generator blowdown rad monitor is isolated by feedwater isolation (SGBSIS). Plausible action to allow sampling, incorrect procedure*
*B. Incorrect. Steam generator blowdown lines are isolated by feedwater isolation (SGBSIS). Plausible action to allow sampling, correct procedure, cannot identify generator with this monitor*
*C. Incorrect. Loop "C" MSIV is closed so no steam from ruptured steam generator is seen by the condenser. correct action to prevent overfill, incorrect procedure*
*D. Correct. After the SGTR, the affected loop steam line atmospheric relief setpoint is raised to minimize cycling, this does not preclude the valve lifting. When the valve starts cycling it results in the rad monitor trending up as a result of steam flow to, past the rad monitor. Appropriate action in EMG E-0, correct procedure transition at Step 17*

**K/A Statement: Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (CFR: 41.11 / 41.12 / 43.4 / 45.9)**

Technical Reference(s): EMG E-3, BD-EMG E-3, LO1732325, SY1407300

Proposed references to be provided to applicants during examination: None

Learning Objective: R1

Question Source: Bank # _______

Modified Bank # _from Practice Exam______
New _______

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _11, 12_
55.43 ___4__

Comments:

Other K/A: 038 EA2.11 (3.7/3.9) {43.5}

Est. Time: 3 min.

Note: 10CFR55.41.11 includes "Purpose and operation of radiation monitoring systems, including alarms and survey equipment." NUREG-1122 contains only one objective tied to 41.11. This objective is 2.3.5 [2.9/2.9]. Therefore, the actual wording of the 10CFR55.41.11 is being used to categorize this question.

Modified stem and distractors from WE 8 question

Modified based on Brendan comments. Changed to Rev. 5 6/15/11

We will see how "B" does on validation. A similar version of this question was on one of the practice exams, so it doesn't have your bank # yet. We will need to submit the Practice Exam question as the original.

Answer: D

96. S 2.4.38 3

Given the following conditions:

- A Site Area Emergency has been declared due to S/G tube rupture with offsite release of radiation
- The TSC is manned, but NOT activated
- The Shift Manager is the acting Site Emergency Manager

Which ONE of the following responsibilities of the Shift Manager CANNOT be delegated to the TSC at the current conditions?

A. Determining protective action recommendations to give to the governmental agencies.

B. Implementing actions recommended by the Recovery/Re-entry Team.

C. Directing the search and rescue operations.

D. Deploying environmental monitoring teams.

*Justification*

*A. Correct.*
*B. Incorrect, actions can be delegated to the Operations Team*
*C. Incorrect, can be delegated to the TSC, EOF*
*D. Incorrect, responsibility of other groups*

*The Shift Manager assumes the duties of the Site Emergency Manager upon the declaration of an Emergency Classification. While performing the duties of the Site Emergency Manager, the Shift Manager may not delegate the following responsibilities:*

- *Emergency Classification*
- *Authorization of Notification of Off-site Authorities*
- *Protective Action Recommendations*
- *Authorization of Emergency Exposure in excess of 10CFR20 Limits*

*EPP 06-006 - The authority to transmit protective action recommendations to the State of Kansas and Coffey County shall not be delegated by the Emergency Manager.*

**K/A Statement: Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required. (CFR: 41.10 / 43.5 / 45.11)**

Technical Reference(s): EPP 06-001, EPP 06-006, EPP 06-008, GE1135628

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 _10___

55.43 __5___

Comments:

Incorporated Brendan comments, changed to Rev. 3, 6/13/11

Answer: A

97. S 2.4.45 5

Given the following plant conditions:

Unit is operating at 100% power

- The following Control Room alarms are received:
  - 038A, LTDN REGEN HX TEMP HI
  - 041A, SEAL INJ TO RCP FLOW LO
  - 042A, CHG LINE FLOW HILO
  - 042E, CHARGING PMP TROUBLE

The following Control Room indications are observed:

- Pressurizer level - 56% - TRENDING DOWN
- Charging Flow - 0 gpm
- Letdown Flow - 75 gpm
- RCP Seal Injection flows at 0 gpm on all pumps

Based on the above indications, which ONE of the following procedures provides the appropriate recovery actions for this event?

A. ALR 00-042E, CHARGING PMP TROUBLE

B. OFN SB-008, INSTRUMENT MALFUNCTIONS

C. ALR 00-041A, SEAL INJ TO RCP FLOW LOW

D. OFN BB-005, RCP MALFUNCTIONS

*Justification*

*A. Correct, 42E completely addresses the loss of a charging pump on the system. The alarm response procedure isolates letdown, re-establishes a charging pump flow, then re-initiates letdown flow. ALR also cautions about gas binding and verifies seal injection flow re-established and refers the user to TRM and TS requirements.*

*B. Incorrect, This is not an instrument failure.*

*C. Incorrect, 41A does not completely address the loss of a charging pump on the CVCS system, only establishes seal injection using alternate valves. Procedure does not account for system response to malfunction, ALR 00-042E is preferred.*

*D. Incorrect, Reactor Coolant pump operation is not jeopardized as long as CCW is supplied to the thermal barrier heat exchanger.*

**K/A Statement: Ability to prioritize and interpret the significance of each annunciator or alarm. (CFR: 41.10 / 43.5 / 45.3 / 45.12)**

Technical Reference(s): ALR 00-042E, SY1301000

Proposed references to be provided to applicants during examination: None

Learning Objective: R1

Question Source: Bank # _47028______
Modified Bank # _______
New _

Question History: Last NRC Exam ___2008 DCPP_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 _10___
55.43 __5___

Comments:

Modified based on Brendan comments. Changed to Rev. 4, 6/13/11

Answer: A

98. S E12 2.4.18 4

Given the following plant conditions:

- A large Main Steam line break has occurred
- All MSIVs failed to CLOSE
- RCS has cooled down to 425°F within 15 minutes following initiation of the event
- Narrow Range levels in all S/Gs are off-scale low
- EMG C-21, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, is in effect and is directing AFW flow reduction

Which ONE of the following describes the Auxiliary Feedwater flow requirements under these conditions and the basis for the flow requirements?

| | **AFW Flow** | **Basis** |
|---|---|---|
| A. | 30,000 lbm/hr per S/G | Extend the life of the Condensate Storage Tank |
| B. | 30,000 lbm/hr per S/G | Minimize the RCS cooldown and to prevent S/G dry out |
| C. | 270,000 lbm/hr to all S/G's | Minimize the RCS cooldown and to ensure adequate heat sink |
| D. | 270,000 lbm/hr to all S/G's | Terminate the RCS cooldown and to prevent Pressurized Thermal Shock (PTS) |

*JUSTIFCATION:*

A. *Incorrect; BD-EMG C-21 addresses dryout which could affect SG tubes. CST life is not the basis. Will not be able to terminate the cooldown until the S/G can be isolated.*
B. *Correct; BD-EMG C-21*
C. *Incorrect; BD-EMG C-21 states that flow should be reduced to minimum measurable flow to a SG of 30,000lbm/hr.*
D. *Incorrect; BD-EMG C-21 states that flow should be reduced to minimum measurable flow to a SG of 30,000lbm/hr.*

**K/A Statement: Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)**

Technical Reference(s): BD-EMG C-21, LO1732334

Proposed references to be provided to applicants during examination: None

Learning Objective: R3

Question Source: Bank # _______
Modified Bank # _______
New __X_____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 _10___
55.43 __1___

Comments:

| | | | |
|---|---|---|---|
| Other K/A: | 040 AK3.04 | (4.5/4.7) | {41.5, 10} |
| | E12 EK2.2 | (3.6/3.9) | {41.7} |
| | E12 EK3.2 | [3.3/3.9] | {41.5, 41.10} |
| | E12 EA1.3 | [3.4/3.5] | {41.7} |
| | 035 K1.01 | [4.2/4.5] | {41.4, 5, 7} |
| | 061 K1.01 | [4.1/4.1] | {41.4, 5, 7} |

Est. Time: 2 min.

Modified based on Brendan comments. Changed to Rev. 4, 6/13/11

Answer: B

99. S E13 EA2.2 4

Given the following plant conditions:

- Reactor trip and SI occurred from 100% RTP
- RCPs are stopped
- MSIVs have closed
- Containment pressure is 8 psig
- “B” SG pressure is 1240 psig
- “B” SG narrow range level peaked at 93% but has since fallen to 81%
- Steam flow of 1.5 MPPH is indicated on "B" SG
- The crew has elected to implement EMG FR-H2, RESPONSE TO STEAM GENERATOR OVERPRESSURE

Which ONE of the following describes the correct action relative to releasing steam?

A. Steam may be released without restriction since narrow range level is on scale.

B. Steam release should NOT occur since natural circulation flow in other loops may be disrupted.

C. Steam release should NOT occur since damage may occur due to water trapped in the steamline.

D. Steam may be released at less than 50 psi per hour to remain within SG tube differential pressure limits.

*Justification*

A. *Incorrect. If the affected SG level has reached the upper tap, then the SG may be filled to the steamline. Decreasing the affected SG level into the narrow range does not ensure that water is removed from the affected steamline. Steamline conditions should be evaluated prior to releasing steam from any SG with level above 93% (79% Adverse) to prevent potential damage to downstream components.*

B. *Incorrect. Natural circulation flow is unaffected.*

C. *Correct. If the affected SG level has reached the upper tap, then the SG may be filled to the steamline. Decreasing the affected SG level into the narrow range does not ensure that water is removed from the affected steamline. Steamline conditions should be evaluated prior to releasing steam from any SG with level above 93% (79% Adverse) to prevent potential damage to downstream components. Transition to H3 is appropriate.*

D. *Incorrect. S/G-RCS differential pressure is not the concern; the concern is overpressurizing the S/G vessel.*

**K/A Statement: Ability to determine and interpret the following as they apply to the (Steam Generator Overpressure) Adherence to appropriate procedures and operation within the limitations in the facility*s license and amendments. (CFR: 43.5 / 45.13)**

Technical Reference(s): EMG FR-H2, BD-EMG FR-H2, LO1732344

Proposed references to be provided to applicants during examination: None

Learning Objective: R3/R4

Question Source: Bank # _______

Modified Bank # _______
New ___X____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis __X__

10 CFR Part 55 Content:
55.41 _____
55.43 __5__

Comments:

Incorporated Lee comments, changed to Rev. 4 6/29/11

Answer: C

100. S E15 2.4.1 3

Given the following plant conditions:

- A large break LOCA has occurred
- One Containment Spray Pump was secured per EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT
- EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, has just been completed when the STA reports the following conditions:
  - Containment Pressure is 26 psig decreasing
  - Containment Radiation is 10 Rad/hr
  - Recirculation sump level is 2004'

Which ONE of the following describes the immediate Containment concern and the correct procedure to enter?

A. Inadequate suction to the RHR pumps, transition to EMG C-11, LOSS OF EMERGENCY COOLANT RECIRCULATION.

B. Flooding vital equipment in Containment; transition to EMG FR-Z2, RESPONSE TO CONTAINMENT FLOODING.

C. Erroneous instrumentation readings, transition to EMG FR-Z3, RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL, when desired.

D. Containment structural integrity; transition to EMG FR-Z1, RESPONSE TO HIGH CONTAINMENT PRESSURE.

*Justification*

*A. Incorrect, Ctmt sump level is adequate, Loss of emergency coolant recirculation is not the procedure that is required to be entered with these conditions.*

*B. Correct, Containment sump level is high and flooding is a concern and level has reached the threshold value to enter FR-Z2.*

*C. Incorrect, Radiation levels are high, but FR-Z2 is entered on operator discretion and sump level is a higher priority.*

*D. Incorrect, Pressure is somewhat high, however with one CTMT Spray Pump running it merits a yellow path EMG FR-Z1*

**K/A Statement: Knowledge of EOP entry conditions and immediate action steps. (CFR: 41.10 / 43.5 / 45.13)**

Technical Reference(s): EMG F-0 Figure 6, EMG FR-Z2, BD-EMG FR-Z2, LO1732351

Proposed references to be provided to applicants during examination: None

Learning Objective: R2

Question Source: Bank # _______
Modified Bank # _______
New ___X____

Question History: Last NRC Exam ___N/A_________

Question Cognitive Level:

Memory or Fundamental Knowledge ______

Comprehension or Analysis __X__

10 CFR Part 55 Content:

55.41 _10___

55.43 __5___

Comments:

Incorporated Jane comments, Replaced K/A due to overlap, changed to Rev. 3 7/6/11

Answer: B