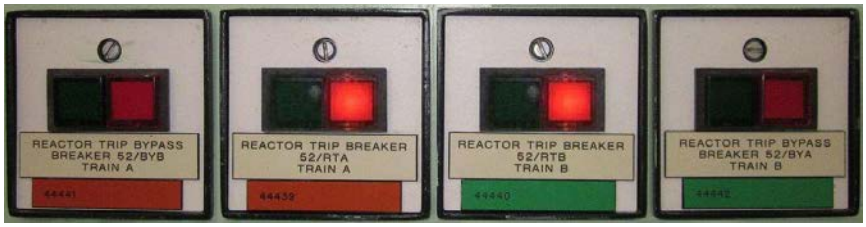
1. P8184L-004 109/007 EK2.02/2.6///P8100/B8//2018 ILT NRC R01

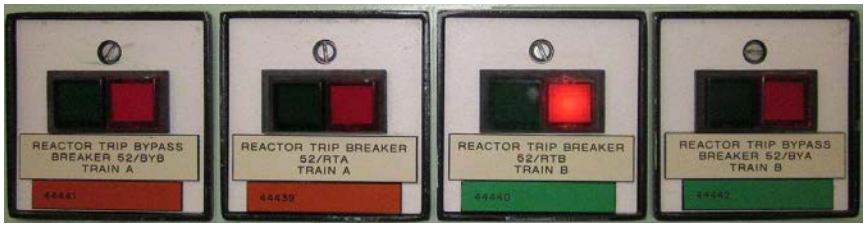
- Unit 1 is at 100% power.
- Train A Safety Injection inadvertently ACTUATES.

Which of the following shows the correct status of reactor trip breakers?

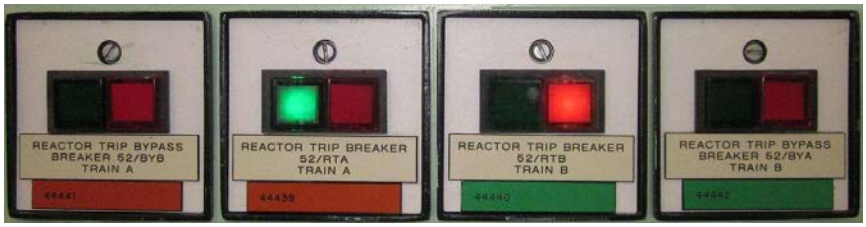
A.



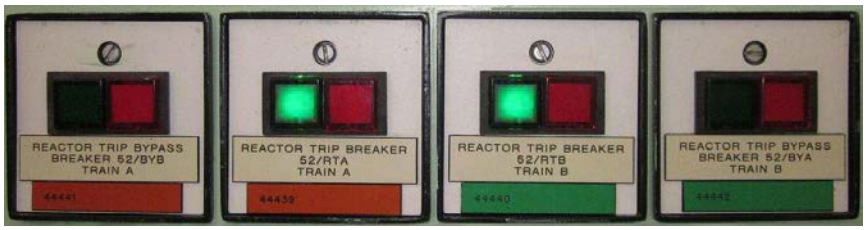

B.




C.




D.✔



3-SPK

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes the reactor protection system requires BOTH trains of SI to actuate to receive a trip signal.
b. Incorrect. Plausible if examinee incorrectly believes an SI signal will only de-energize the breaker indicating light, similar to a loss of Train A DC.
c. Incorrect. Plausible if examinee incorrectly believes RPS trip circuitry only trips the associated train reactor trip breaker.
d. Correct. Any SI signal will de-energize the reactor trip coil UV relays and energize the shunt trip coils causing reactor trip breakers to open and drop rods into the core.

K/A Number:
007 Reactor Trip
EK2.02:
Knowledge of the interrelations between a reactor trip and the following:
Breakers, relays, and disconnects.

K/A Value: 2.6

Technical Reference(s): B8, pg 13

Proposed references to be provided to applicants during examination: None

Learning Objective: P8184L-004 Obj. 3H

For reactor trip switchgear, describe the control room controls and indications.

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:

- A LOCA from the pressurizer vapor space is in progress.
- The following is an excerpt from 1E-1, Loss of Reactor or Secondary Coolant.

| | | |
|---|---|---|
| 5 | **Check PRZR PORVs And Block Valves:** | |
| | a. Power to block valves - AVAILABLE | a. Restore power to block valves. |
| | b. PRZR PORVs - CLOSED | b. IF PRZR pressure less than 2335 psig, THEN manually close PRZR PORVs.<br><br>IF any PRZR PORV can NOT be closed, THEN manually close its block valve. |
| | c. Block valves - AT LEAST ONE OPEN | c. Open one block valve unless it was closed to isolate an open PRZR PORV. |

The reason for maintaining at least one PRZR PORV BLOCK Valve OPEN is to ensure availability of a Pressurizer_____(1)_____for RCS_____(2)_____excursions.

A. (1) PORV
(2) level

B. ✔ (1) PORV
(2) pressure

C. (1) PRZR safety
(2) level

D. (1) PRZR safety
(2) pressure

*1-B*

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes this is the PORV is designed to combat a high level condition rather than high pressure.
b. Correct. At least one block valve is left open to ensure availability of at least one PORV for pressure excursions in the RCS due to degraded situations such as inadequate core cooling or an event misdiagnosis such as SGTR.
c. Incorrect. Plausible if examinee incorrectly believes the block valves are upstream of the safety valves rather than the PORVs and that the safety valves are designed to relieve a high level condition rather than a pressure condition.
d. Incorrect. Plausible if examinee incorrectly believes PRZR safety valves are on the same line as PORVs, which they are not.

K/A Number:
008 Pressurizer Vapor Space Accident
AK3.03:
Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident:
Actions contained in EOP for PZR vapor space accident/LOCA

K/A Value: 4.1

Technical Reference(s): 1E-1 bases, pg. 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-012 Obj. 6

EXPLAIN the purpose for any step or step sequence for associated E Series EOP.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam N/A

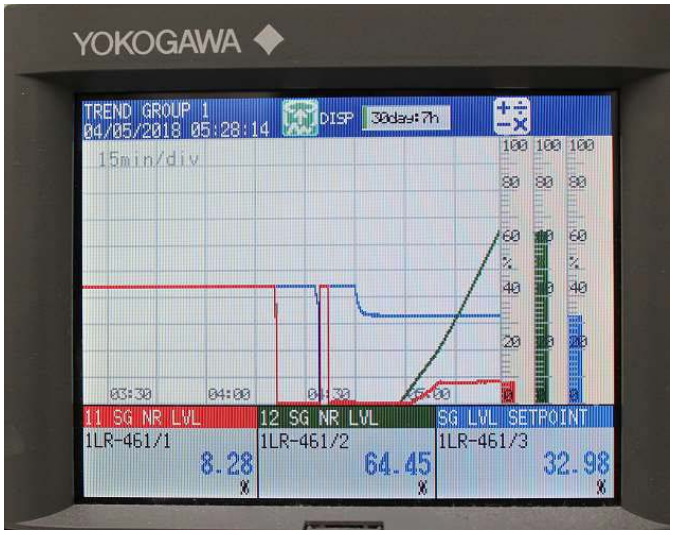
Question Cognitive Level:
Memory or Fundamental Knowledge X
Comprehension or Analysis _____

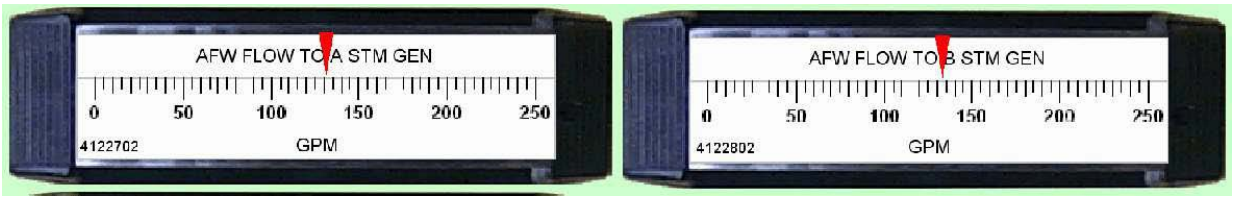
10 CFR Part 55 Content:
55.41 3
55.43 _____

Comments:

3. P8180L-007 227/009 EA1.11/4.1/5/NO/P8100/1E-1//2018 ILT NRC R03

- A SMALL BREAK LOCA occurred.
- Containment is NOT Adverse.
- BOTH Steam Generators are INTACT.
- The crew is performing step 3 of 1E-1, Loss of Reactor or Secondary Coolant.




- 1E-1 (excerpt) is provided.

The Reactor Operator will_____(1)_____AFW flow to___(2)___Steam Generator.

A. (1) RAISE
(2) A

B. (1) RAISE
(2) B

C. (1) LOWER
(2) A

D.✔ (1) LOWER
(2) B

3-SPR

Justification:
a. Incorrect. Plausible if the examinee incorrectly believes that Wide Range levels should be used.
b. Incorrect. Plausible if the examinee incorrectly believes that it is desirable to maintain one SG high out of band to provide sufficient mass for post loca cooldown and depressurization.
c. Incorrect. Plausible if the examinee incorrectly believes that lowering flow will cause SG pressure to go down causing level to swell.
d. Correct.

K/A Number:
009 Small Break LOCA
EA1.11:
Ability to operate and monitor the following as they apply to a small break LOCA:
AFW/MFW.

K/A Value: 4.1

Technical Reference(s): 1E-1 pg 3

Proposed references to be provided to applicants during examination: 1E-1 pg 3

Learning Objective: P8180L-007 Obj. 5

State the functional interrelationship between the Auxiliary Feedwater System and the following systems: Steam Generators

Question Source: Bank # _____
Modified Bank # _____
New X

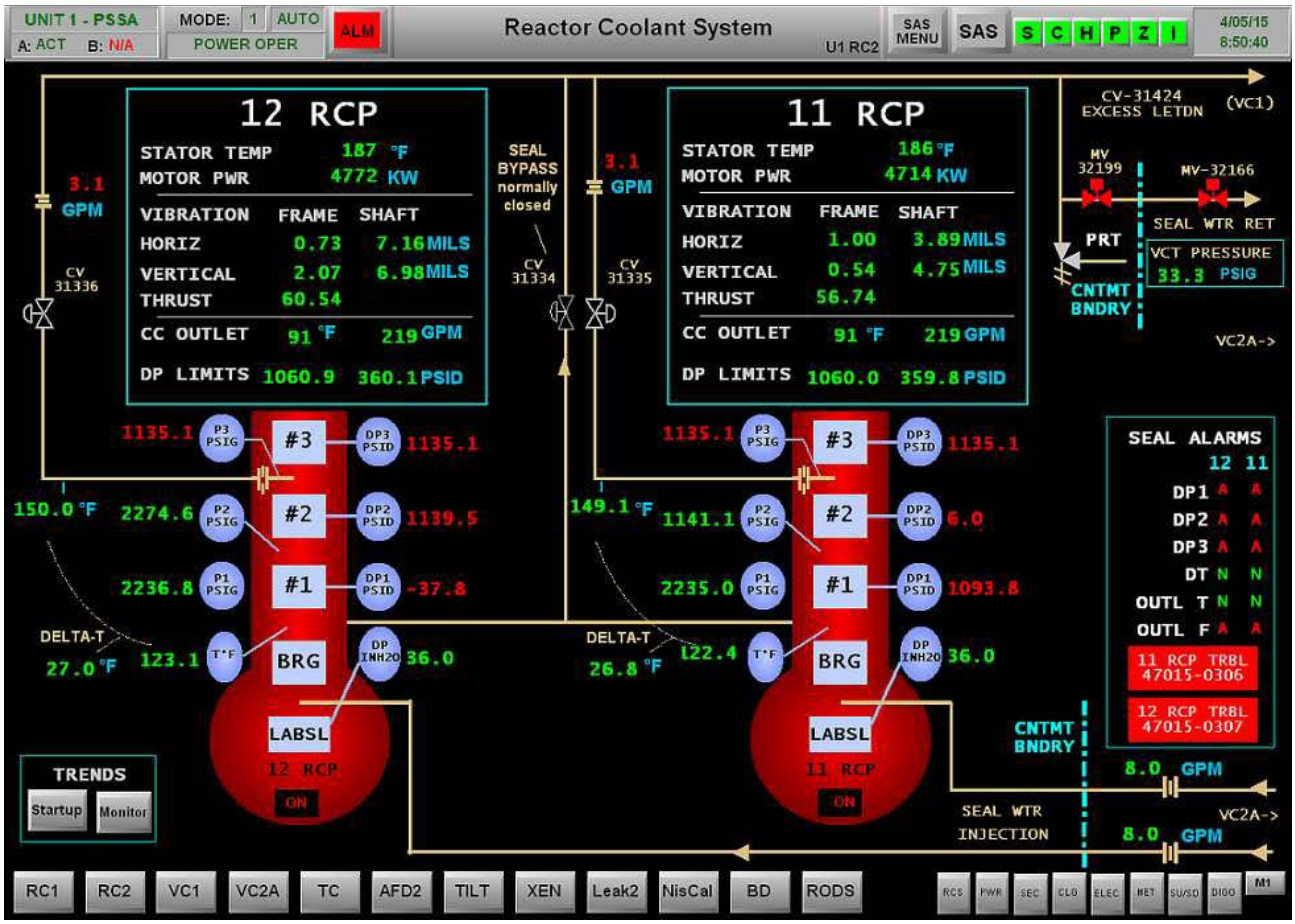
Question History: Last NRC Exam N/A

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

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

4. P8170L-002 151/015 AA2.01/3.0/7B/2018 ILT NRC R04/P8100/P8170L-002//2018 ILT NRC R04




Which RCP Seals have failed?

| | 12 RCP | 11 RCP |
|---|---|---|
| A. ✔ | #1 | #2 |
| B. | #1 | #3 |
| C. | #3 | #2 |
| D. | #3 | #3 |

3-SPK

Justifications:
a. Correct.
b. Incorrect. Plausible if examinee incorrectly believes 11-#3 seal is failed because there is minimal pressure change from #2 to #3.
c. Incorrect. 12#2 seal is failed. Plausible if examinee incorrectly believes 11-#3 seal is failed because there is minimal pressure change from #2 to #3.
d. Incorrect. Plausible if examinee incorrectly believes that equal pressures and DPs are indicators of a failed seal.

K/A Number:
015 RCP Malfunctions
AA2.01:
Ability to determine the following as they apply to the Reactor Coolant Pump Malfunctions: Cause of RCP failure.

K/A Value: 3.0

Technical Reference(s): P8170L-002 Pg 17

Proposed references to be provided to applicants during examination: None

Learning Objective: P8170L-002 objective 7B

Predict the loss of a system to a component failure.

Question Source: Bank # X
Modified Bank # _____
New _____

Question History: Last NRC Exam 2015 Biennial, 2017 Biennial

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

10 CFR Part 55 Content:
55.41 3
55.43 _____

Comments:

5. P8172L-002 205/026 AK3.03/4.0/5.A.//P8100/1ES-1.2//2018 ILT NRC R05

- A large break LOCA has occurred.


Based on the above indications ONLY, train (1) of RHR will be placed in RECIRCULATION mode because (2).

A. ✔ (1) A
(2) train B can NOT remove decay heat

B. (1) A
(2) train B is providing cooling to 12 RCP

C. (1) B
(2) train A can NOT remove decay heat

D. (1) B
(2) train A is providing cooling to 11 RCP

3-SPK

Justifications:
a. Correct.
b. Incorrect. Plausible if the examinee incorrectly believes that RHR and not charging provides seal cooling to RCPs.
c. Incorrect. Plausible if the examinee incorrectly believes that RHR is cooled by cooling water and that, when travel stops are removed, the load CC puts on the system chokes RHR.
d. Incorrect. Plausible if the examinee incorrectly believes that one train of CC must be available to provide cooling to the RCP thermal barrier.

K/A Number:
026 Loss of Component Cooling Water
AK3.03:
Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water:
Guidance actions contained in EOP for Loss of CCW.

K/A Value: 3.9

Technical Reference(s): 1ES1.2 pg 4 and bases pg 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8172L-002 Obj. 5A

State the functional interrelationship between the Component Cooling System and the following systems, also predict the effect of a loss of Component Cooling on each system: RHR.

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
55.43 _____

Comments:

6. P8197L-011 143/027 AK3.03/3.7/P8140L-247 #7//P8100/ECA-0.0//2018 ILT NRC R06

- Unit 1 has experienced a Loss of All AC power.
- 1ECA-0.0, Loss of All Safeguards AC Power, is in progress.

Which of the following is true concerning 1ECA-0.0?

The Pressurizer PORVs are ...

A. ✔ checked CLOSED to prevent mass loss from the RCS.

B. operated as necessary to control RCS pressure at 2235 psig.

C. opened to rapidly depressurize the RCS to minimize leakage through the RCP seals.

D. isolated by closing associated BLOCK valves to prevent mass loss from the RCS.

1-B

Justifications:
a. Correct. PORVs are verified close with guidance to reverify closure if activated.
b. Incorrect. Plausible as PORV's are one of the few remaining methods of pressure control in a loss of all AC situation, but they are not used to maintain normal operating pressure.
c. Incorrect. Plausible as SG PORVs are opened to achieve RCS cooldown/depressurization, but this is not done via the Pressurize PORVs.
d. Incorrect. Plausible as this is the action taken in the event of a PORV inoperability and loss of all AC is, incorrectly, assumed to result in PORV inoperability.

K/A Number:
027 Pressurizer Pressure Control System Malfunction
AK3.03:
Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions:
Actions contained in EOP for PZR PCS malfunction

K/A Value: 3.7

Technical Reference(s): ECA-0.0, background information page 2

Proposed references to be provided to applicants during examination: None

Learning Objective: P8140L-247 Obj. 7.

For ECA-0.0, explain the purpose for any step or step sequence for the associated E or FR series EOP.

Question Source: Bank # P8197L-011 143
Modified Bank # _____
New _____

Question History: Last NRC Exam 2014 ILT Audit

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

10 CFR Part 55 Content:
55.41 10
55.43 _____

Comments:

7. P8197L-014 183/0029 2.1.20/4.6/7//P8100/1FR-S.1//2018 ILT NRC R07

- The crew is on step 4 of 1FR-S.1, Response to Nuclear Power Generation/ATWS.

The crew will (1) the RCS from the (2) tank(s).

A. (1) DILUTE
(2) Reactor Make Up

B. (1) DILUTE
(2) Condensate Storage

C. ✔ (1) BORATE
(2) Boric Acid Storage

D. (1) BORATE
(2) Refueling Water Storage

*2-RI*

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes removing boron will add negative reactivity. Also, RMU is the normal source for dilution.
b. Incorrect. Plausible if examinee incorrectly believes removing boron will add negative reactivity. CST plausible as this is a source of unborated water; however, it used for secondary systems.
c. Correct.
d. Incorrect. Plausible as boration is the correct path; however, in this case RWST would not be used unless normal and emergency boration failed. The examinee is not being told that the former has failed.

K/A Number:
029 Anticipated Transient Without Scram (ATWS)
2.1.20:
Ability to interpret and execute procedure steps.

K/A Value: 4.6

Technical Reference(s): 1FR-S.1 pg. 4

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-014 Obj. 7

For FR-S.1, explain the purpose for any step or step sequence for associated E or FR series EOP.

Question Source: Bank # P8197L-014 183
Modified Bank # _____
New _____

Question History: Last NRC Exam 2014 ILT Exam

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

10 CFR Part 55 Content:
55.41 1
55.43 _____

Comments:

8. P8197L-013 121/038 EK1.01/3.1/6//P8100/1E-3/STEAM TABLES/2018 ILT NRC R08

- 11 Steam Generator is RUPTURED.

- ERCS is OOS.

- RCS pressure is 1965 psig.
- RCS Core Exit Temperature is 535 °F.
- Containment is NOT adverse.

RCS SUBCOOLING is...

A. LESS THAN 0 °F.

B. BETWEEN 0 and 21 °F.

C. BETWEEN 21 and 41 °F.

D.✔ GREATER THAN 41 °F.

*3-SPR*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that because pressure is higher than temperature, the RCS is superheated.
b. Incorrect. Plausible if the examinee incorrectly believes that subcooling is determined by dividing pressure by temperature.
c. Incorrect. Plausible if the examinee incorrectly believes that subcooling is determined by subtracting current RCS temperature from Tav at 100% power.
d. Correct. The values used for the answers distractors are taken from procedural decision points. At 21 degrees, the cooldown of the RCS must be stopped. Prior to starting the cooldown, if RCS subcooling is less than 41 degrees F, then a transition out of the procedure occurs.

K/A Number:
038 Steam Generator Tube Rupture
EK1.01:
Knowledge of the operation implications of the following concepts as they apply to the SGTR:
Use of steam tables.

K/A Value: 3.9

Technical Reference(s): Steam Tables

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-013 Obj. 6

Explain the purpose for any step or step sequence for associated E series EOP.

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:

9. P8197L-012 260/WE12 EA1.2/3.6/40//P8100/ECA-2.1/SIM PIC/2018 ILT NRC R09

- The Crew is performing 1ECA-2.1, Uncontrolled Depressurization of Both Steam Generators.
- 11 Turbine Driven Auxiliary Feedwater Pump is OUT OF SERVICE.
- Containment pressure is ADVERSE.

- RCS cold legs have cooled down 150°F in the last 10 minutes.


What direction will the Reactor Operator manipulate AFW flow control valves?

| | MV-32381<br>12 MD AFWP TO 11 STM GEN | MV-32382<br>12 MD AFWP TO 12 STM GEN |
|---|---|---|
| A. | OPEN | OPEN |
| B. | OPEN | CLOSE |
| C. | CLOSE | OPEN |
| D.✔ | CLOSE | CLOSE |

*2-RI*

Justifications
a. Incorrect. Plausible if the examinee incorrectly believes that AFW should be maximized to prevent SG dryout.
b. incorrect. Plausible if the examinee incorrectly believes that the flow must be equalized at 200 gpm.
c. incorrect. Plausible if the examinee incorrectly believes that flow to 12 must be maximized to preserve one SG and that 12 should be used because the 11 pump is OOS.
d. Correct.

K/A Number:
W/E12 Uncontrolled Depressurization of all Steam Generators
EA1.2:
Operating behavior characteristics of the facility

K/A Value: 3.6

Technical Reference(s): 1ECA-1.2 pg 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-012 Obj. 40

For procedure ECA-2.1 Describe the major action categories for associated E series EOP.

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:

10. P8174L-003 123/054 AA2.02/4.1/7B//P8100/47010-0101/1C1.4 AOP1/2018 ILT NRC R10

- Unit 1 is at 75% power.

- The 11 Main Feedwater Pump trips.
- 47010-0101, 11 Feedwater Pump Locked Out, is in alarm.

Per C47010-0101, the Reactor Operator will...

A. START 11 TDAFW Pump.

B. MANUALLY trip the reactor.

C. ✔ LOWER turbine power to less than 330 MWe.

D. take MANUAL control of 11 Main Feedwater Regulating Valve.

*2-RI*

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes that AFW can be used to supplement MFW.
b. Incorrect. Plausible as the unit is limited to 62% power with only 1 MFP; however, in this case the ARP does not require a trip unless power is above 85% or both MFWP have tripped.
c. Correct.
d. Incorrect. Plausible if examinee incorrectly believes that SGWL can be maintained with FWRVs.

K/A Number:
054 Loss of Main Feedwater
AA2.02:
Ability to determine and interpret the following as they apply to the Loss of Main Feedwater: Differentiation between loss of all MFW and trip of one MFW pump.

K/A Value: 4.1

Technical Reference(s): C47010 -0101

Proposed references to be provided to applicants during examination: None

Learning Objective: P8174L-003 Obj. 7B

Predict the response of the system to a component failure.

Question Source: Bank # P8174L-003 121
Modified Bank # _____
New _____

Question History: Last NRC Exam 2014 ILT AUDIT (SRO ONLY)

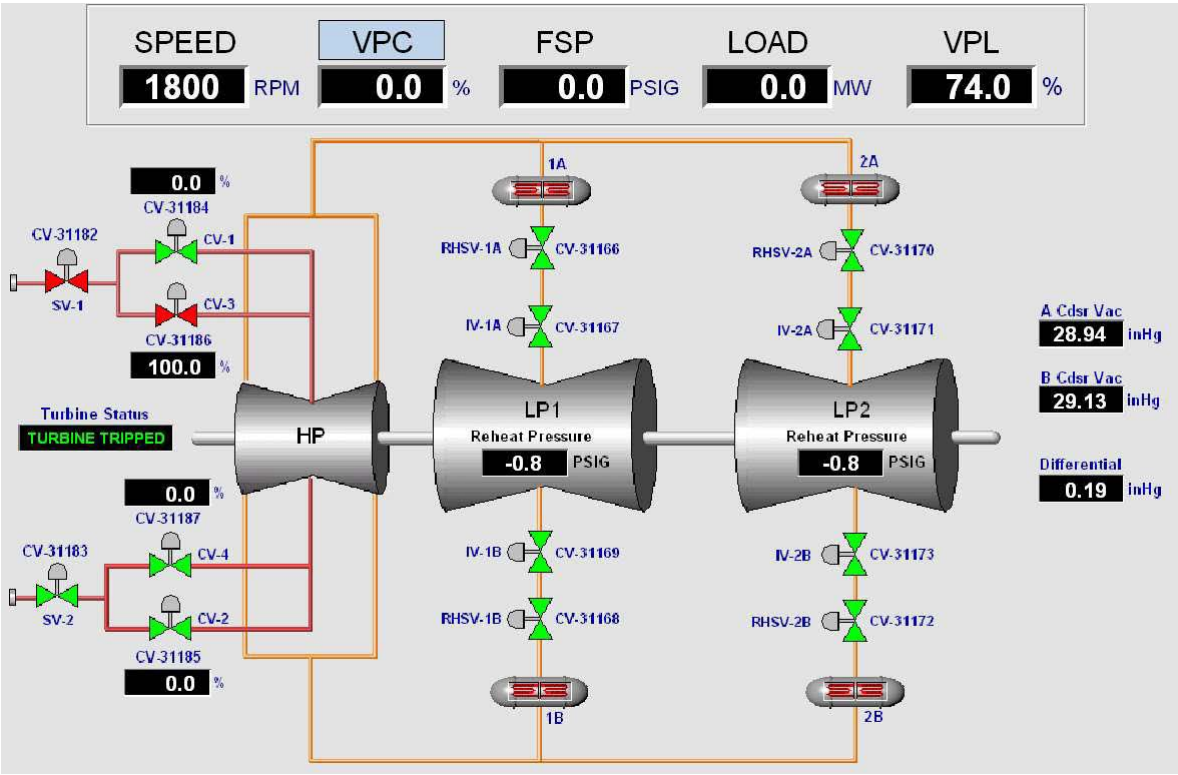
Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

11. P8140L-224 006/007 EA1.07/4.3/4//P8100/1E-0//2018 ILT NRC R11

- A loss of all AC power has occurred.
- The crew is on step 2 of 1E-0, Reactor Trip or Safety Injection.
- CS-46427, TURB TRIP, has been depressed.




Per step 2 of 1E-0, the operator will...

A. NOT close either MSIV.

B. CLOSE the A train MSIV ONLY.

C. CLOSE the B train MSIV ONLY.

D.✔ CLOSE BOTH MSIVs.

*3-SPK*

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes the turbine is tripped because steam is secured to the low pressure turbine.
b. Incorrect. Plausible if examinee incorrectly believes the trains of main steam are separated, similar to safety related equipment.
c. Incorrect. Plausible if examinee incorrectly believes the trains of main steam are separated, similar to safety related equipment and steam must continue to be supplied to the turbine since it did not trip.
d. Correct.

K/A Number:
055 Loss of Offsite and Onsite Power (Station Blackout)
2.4.49:
Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

K/A Value: 4.6

Technical Reference(s): 1E-0 pg 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8140L-224 Obj. 4

For 1E-0, List the immediate action steps (AER & RNO) and their sequence.

Question Source: Bank # _____
Modified Bank # P8140L-224 002
New _____

Question History: Last NRC Exam 2016 ILT (sig mod)

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

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

12. P8170L-003 224/065 AK1.01/3.1*/4//P8100/B4A/P8170L-003/2018 ILT NRC R12

The STEAM GENERATORS are located at a (1) elevation than the REACTOR VESSEL to (2).

A. (1) LOWER
(2) conserve INVENTORY during a LOCA

B. (1) LOWER
(2) promote NATURAL CIRCULATION

C. (1) HIGHER
(2) conserve INVENTORY during a LOCA

D. ✔ (1) HIGHER
(2) promote NATURAL CIRCULATION

*1-F*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that if the core is the highest point, the RCPs will not be able to siphon water out of the core during a loca.
b. Incorrect. This is to promote natural circ. Plausible if the examinee incorrectly believes that the pressure from the steam will force the condensed water back in the core and that only reflux boiling can occur if the SG were higher.
c. Incorrect. The SG is at a higher elevation. Plausible if the examinee incorrectly believes that the elevation of the piping above the core creates natural pressure in the core to prevent boil off.
d. Correct.

K/A Number:
056 Loss of Offsite Power
AK1.01:
Knowledge of the operational implications of the following concepts as they apply to the Loss of Offsite Power:
Principle of cooling by natural convection.

K/A Value: 3.1*

Technical Reference(s): B4A pg 31, P8170L-003 pg 10

Proposed references to be provided to applicants during examination: None

Learning Objective: P8170L-003 Obj. 4

Describe the system flowpath and major components for emergency operations.

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
55.43 _____

Comments:

13. P8186L-005 044/058 AK2.02/2.2/7//P8100/1C20.9 AOP2//2018 ILT NRC R13

- Unit 1 is at 100% power.

- BOTH 11 AND 12 Component Cooling Water (CC) Pumps are RUNNING.

- A loss of U1 train A DC has occurred.
- A loss of U1 train B DC has occurred.

CC Pump breakers (1) OPEN AUTOMATICALLY.
All 4160V breaker manipulations must be made (2).

A. (1) WILL
(2) LOCALLY

B. (1) WILL
(2) from the CONTROL ROOM

C. ✔ (1) WILL NOT
(2) LOCALLY

D. (1) WILL NOT
(2) from the CONTROL ROOM

*1/*

Justifications:
a. Incorrect. All breaker manipulations must be made manually. Plausible if the examinee incorrectly believes that loss of DC causes all pumps to trip.
b. Incorrect. Plausible if the examinee incorrectly believes that loss of all DC causes all pumps to trip and that breaker manipulations must be made from the control room because of safety concerns making local manipulations.
c. Correct.
d. Incorrect. Per a procedural note, it is hazardous to operate breakers locally. Plausible if the examinee incorrectly believes that operation from the control room is possible and the hazard of local operation is too great.

K/A Number:
058 Loss of DC Power
AK2.02:
Knowledge of the interrelations between the loss of DC power and the following:
Breakers, relays, and disconnects.

K/A Value: 2.2

Justification for K/A less than 2.5: At Prairie Island, a loss of DC will cause the Control Room to lose the ability to remotely operate some safeguards equipment (e.g. breakers), therefore this knowledge is important to Reactor Operators at Prairie Island.

Technical Reference(s): 1C20.9 AOP 2 pg 5

Proposed references to be provided to applicants during examination: None

Learning Objective: P8178L-001A Obj. 4E

Predict the response of the system to a loss of power.

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:

14. P8176L-003 084/062 AK3.02/3.6/4C//P8100/P8176L-003//2018 ILT NRC R14

- MV-32033, Turbine Cooling Water Header Valve, automatically closes on low pressure coincident with Safety Injection after a time delay.

The reason for the time delay is to...

A. avoid tripping the reactor.

B. avoid securing feed to AFW.

C. allow safety injection to repressurize the RCS.

D. ✔ allow a safeguards pump to repressurize the header.

*1-B*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that when one unit has an SI, pressure may lower in the headers supplying water to the operating unit's Turbine building loads. Securing these loads would cause a unit trip.
b. Incorrect. AFW is located in the turbine building and can be supplied by cooling water. Plausible if the examinee incorrectly believes that closing the turbine cooling water header valve secures the CL feed to AFW.
c. Incorrect. Plausible if the examinee incorrectly believes cooling water is feeding the RCS.
d. Correct.

K/A Number:
062 Loss of Nuclear Service Water
AK3.02:
Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water:
The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS.

K/A Value: 3.6

Technical Reference(s): P8176L-003 pg 45

Proposed references to be provided to applicants during examination: None

Learning Objective: P8176L-003 Obj. 4C

Describe the system flowpath and major components for: Emergency operations

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam N/A

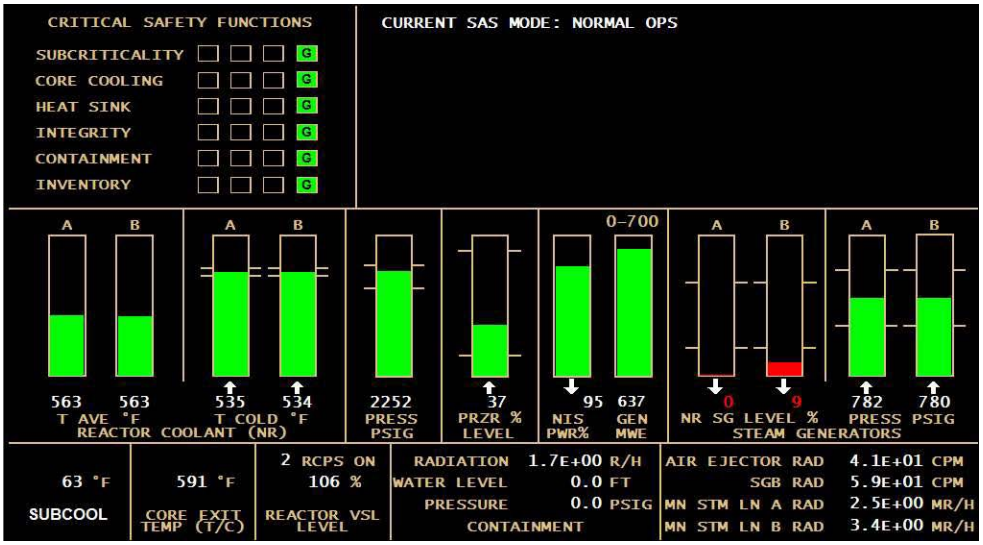
Question Cognitive Level:
Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

15. P8178L-005 054/065 AA2.06/3.6*/4.2/7//P8100/P8178L-005//2018 ILT NRC R15

- Unit 1 Instrument Air header pressure is lowering.
- Operators are responding per C34 AOP1, Loss of Instrument Air.




What is the FIRST action the Reactor Operator will take?

A. ✔ Trip the reactor

B. Turn Pressurizer Heaters OFF

C. Place Excess Letdown in service

D. Manually control Charging Pump speed

2-RI

Justifications:
a. Correct. The main feedwater regulating and bypass valves will fail closed within minutes on a loss of instrument air. This causes steam generator levels to rapidly lower and requiring a reactor trip.
b. Incorrect. Most pressurizer heaters are turned off per C34 AOP1. Plausible if the examinee incorrectly believes that no parameter currently requires a reactor trip and that all heaters are secured in C34 AOP1.
c. Incorrect. Letdown orifice valves fail closed, resulting in a loss of letdown. The loss of letdown causes pressurizer level to rise. This overcomes the loss of charging because seal injection to the RCPs is still established. Therefore, net effect is that pressurizer level will rise. It will take several hours with no operator actions until a reactor trip would be required in this situation. Plausible if the examinee incorrectly believes that this action is urgent and no other parameters require immediate RX trip.
d. Incorrect. Letdown orifice valves fail closed, resulting in a loss of letdown. The loss of letdown causes pressurizer level to rise. This overcomes the loss of charging because seal injection to the RCPs is still established. Therefore, net effect is that pressurizer level will rise. It will take several hours with no operator actions until a reactor trip would be required in this situation. Plausible if the examinee incorrectly believes that with letdown secured, it is urgent to manually control charging flow to minimum to avoid lifting reliefs in the charging system.

K/A Number:
065 Loss of Instrument Air
AA1.05:
Ability to operate and/or monitor the following as they apply to the Loss of Instrument Air: RPS.

K/A Value: 3.3*

Technical Reference(s): B7 pg 42.

Proposed references to be provided to applicants during examination: None

Learning Objective: P8178L-005 Obj. 7

Predict the response of the Instrument and Station Air System to a decreasing air header pressure.

Question Source: Bank # _____
Modified Bank # P8178L-005 029
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 4
55.43 _____

Comments:

16. P8186L-009 011/077 AA1.05/3.6/RHR/SI LP//P8100///2018 ILT NRC R16

- A LOSS OF OFFSITE POWER has occurred
- Bus 16 is LOCKED OUT
- SI has been ACTUATED.



What is the status of 12 RHR Pump and 12 SI Pump?

| | 12 RHR Pump | 12 SI Pump |
|---|---|---|
| A. | RUNNING | RUNNING |
| B. | RUNNING | NOT RUNNING |
| C. | NOT RUNNING | RUNNING |
| D.✔ | NOT RUNNING | NOT RUNNING |

2-RI

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that both pumps are running because SI is actuated.
b. Incorrect. Plausible if the examinee incorrectly believes that the green light indicates that the pump is running.
c. Incorrect. Plausible if the examinee incorrectly believes that the red light indicates the pump is running.
d. Correct.

K/A Number:
077 Generator Voltage and Electric Grid Disturbances
AA2.07:
Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances:
Operational status of engineered safety features.

K/A Value: 3.6

Technical Reference(s): B15 pg 6, B18A pg 5

Proposed references to be provided to applicants during examination: None

Learning Objective: P8186L-003 Obj. 10a

Predict the response of the system to a loss of power

Question Source: Bank # P8186L-009 11
Modified Bank # _____
New _____

Question History: Last NRC Exam 2017 LOR

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

10 CFR Part 55 Content:
55.41 7
55.43 _____

Comments:

17. P8197L-012 261/E11 2.2.38/3.6/24//P8100/1ECA-1.1//2018 ILT NRC R17

- The crew is performing 1ECA-1.1, Loss of Emergency Coolant Recirculation.
- Containment pressure is 49 psig.
- RWST level is 42% and lowering.
- ALL CFCUs are running in safeguards mode.

The Reactor Operator leaves 2 Containment Spray Pumps running to prevent...

A. OVERCOOLING THE RCS.

B. OVERCOOLING CONTAINMENT.

C. OVERPRESSURIZING THE RCS.

D. ✔ OVERPRESSURIZING CONTAINMENT.

*1-B*

Justifications:

a. Incorrect. Limitations do exist in the facility license for overcooling the RCS. Plausible if the examinee incorrectly believes that CS pumps are adding heat to the RCS similar to RCPs.
b. Incorrect. Plausible if the examinee incorrectly believes that the CS pumps are adding heat to containment by running similar to RCPs adding heat to containment.
c. Incorrect. Limitations exist in the facility license for overpressurizing the RCS. Plausible if the examinee incorrectly believes that CS pumps draw from the RCS to reduce pressure in both the RCS and containment.
d. Correct. The table contained in step 5 is based on ensuring enough containment cooling from CS pumps and fan coil units to ensure that the RWST level is preserved where possible and that the design basis pressure for containment is not exceeded.

K/A Number:
W/E11 Loss of Emergency Coolant Recirc
2.2.38:
Knowledge of the conditions and limitations in the facility license.

K/A Value: 3.6

Technical Reference(s): 1ECA-1.1 Bases page 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-012 Obj. 24

For ECA-1.1, explain the purpose for any step or step sequence for associated E Series EOP.

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:

18. P8197L-014 208/E05 EK1.2/3.9/25//P8100/FR-H.1//2018 ILT NRC R18

- The operators are implementing actions of 1ECA-2.1, Uncontrolled Depressurization Of Both Steam Generators.
- The Reactor Operator has reduced total feed flow to 90 gpm.
- 11 and 12 Steam Generator Wide Range levels are 30%.
- A RED path exists on HEAT SINK.
- All other Critical Safety Functions are GREEN.

1) Will the crew perform actions of 1FR-H.1, Response to Loss of Secondary Heat Sink?

2)Why?

A. 1) Yes
2) Feedflow has been established to a faulted Steam Generator.

B. 1) Yes
2) Operator action was taken to reduce AFW flow below 200 gpm.

C. ✔ 1) No
2) Operator action was taken to reduce AFW flow below 200 gpm.

D. 1) No
2) Monitoring of Critical Safety Function Status Trees has not been initiated.

*Level 1 - P*

Justifications:
a. Incorrect. Plausible if examinee incorrectly understands note at the beginning of FR-H.1 because transition to FR-H.1 is required and only allows feedflow to faulted SG if no non-faulted SG is available.
b. Incorrect. Plausible because operator action was in fact taken that caused the red path, however the procedures direct that no actions are taken.
c. Correct.
d. Incorrect. Plausible if examinee incorrectly believes that CSF monitoring has not begun because transition out of E-0 occurred prior to step 14.

K/A Number:
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink
EK1.2:
Knowledge of the operational implications of the following concepts as they apply to the (Loss of Secondary Heat Sink):
Normal, abnormal, and emergency operating procedures associated with (Loss of Secondary Heat Sink)

K/A Value: 3.9

Technical Reference(s): 1FR-H.1 pg 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-014 Obj. 25

For FR-H.1, describe the purpose for any step or step sequence.

Question Source: Bank # X
Modified Bank # _____
New _____

Question History: Last NRC Exam 2016 AUDIT

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

10 CFR Part 55 Content:
55.41 10
55.43 _____

Comments:

19. P8184L-005 095/003 AA1.03/3.6/3E//P8100/1C5 AOP4/B6/2018 ILT NRC R19

- Unit 1 is performing a reactor startup.
- Control Bank D is at 75 STEPS.

- Control Bank D Rod G-11 drops to the bottom.
- Rod G-11 Rod Bottom Light is LIT.
- Rod G-11 Rod Position Indication is at 0 steps.
- NIS power is lowering.

Annunciator 47013-0407, ROD AT BOTTOM, will_____(1)_____and the Reactor Operator will _____(2)_____the reactor.

A. ✔ (1) ALARM
(2) TRIP

B. (1) ALARM
(2) NOT TRIP

C. (1) NOT ALARM
(2) TRIP

D. (1) NOT ALARM
(2) NOT TRIP

1-F

Justifications:
a. Correct. the Rod at bottom alarm is in because Bank D Group Counter is above 35 steps.
b. Incorrect. Plausible as the Rod at Bottom alarm is in and if examinee incorrectly believes the reactor does not have to be tripped due to being at low power.
c. Incorrect. Plausible if examinee incorrectly believes Bank D has not been withdrawn high enough to clear the Rod at Bottom interlock.
d. Incorrect. Plausible if examinee incorrectly believes Bank D has not been withdrawn high enough to clear the Rod at Bottom interlock and incorrectly believes the reactor does not have to be tripped due tobeing at low power.

K/A Number:
003 Dropped Control Rod
AA1.03:
Ability to operate and/or monitor as they apply to the Dropped Control Rod:
Rod control switches.

Technical Reference(s): 1C5 AOP4 pg 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8184L-005 Obj. 3E

For each of the major system components describe the automatic functions including starts, trips and interlocks and their set points.

Question Source: Bank # X
Modified Bank # _____
New _____

Question History: Last NRC Exam 2014 ILT AUDIT

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

10 CFR Part 55 Content:
55.41 6
55.43 _____

Comments:

20. P8170L-006 065/028 AK1.01/2.8/7//P8100/B4A//2018 ILT NRC R20

- 11 Charging Pump is running in AUTOMATIC.
- The REFERENCE LEG of the CONTROLLING CHANNEL of pressurizer LEVEL control is RUPTURED.

1) What direction will Control Room indication fail?

2) Will the invalid signal be REJECTED by the Pressurizer Level program?

A. 1) LOW
2) NO

B. 1) LOW
2) YES

C. ✔ 1) HIGH
2) NO

D. 1) HIGH
2) YES

*1-I*

Justifications:
a. Incorrect. The invalid signal will NOT be rejected. Plausible if the examinee incorrectly believes that CR indication will fail low because pressure is lowering in the reference leg.
b. Incorrect. Other control systems in the plant are capable of rejecting failed signals. Examples are SGWLC, auctioneered Hi Tavg, and Subcooling based on CETC. Plausible if the examinee incorrectly believes that CR indication will fail low because pressure is lowering in the reference leg and if the examinee incorrectly believes the level control is capable of rejecting failed signals.
c. Correct.
d. Incorrect. Other control systems in the plant are capable of rejecting failed signals. Examples are SGWLC, auctioneered Hi Tavg, and Subcooling based on CETC. Plausible if the examinee incorrectly believes the level control is capable of rejecting failed signals.

K/A Number:
028 Pressurizer Level Control Malfunction
AK1.01:
Knowledge of the operational implications of the following concepts as they apply to Pressuirzer Level Control Malfunctions:
PZR reference leak abnormalities.

K/A Value: 2.8*

Technical Reference(s): B4A pg 17 and 44

Proposed references to be provided to applicants during examination: None

Learning Objective: P8170L-006 Obj. 7

For pressuirzer level control, predict the response of the system to a: component failure.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam N/A

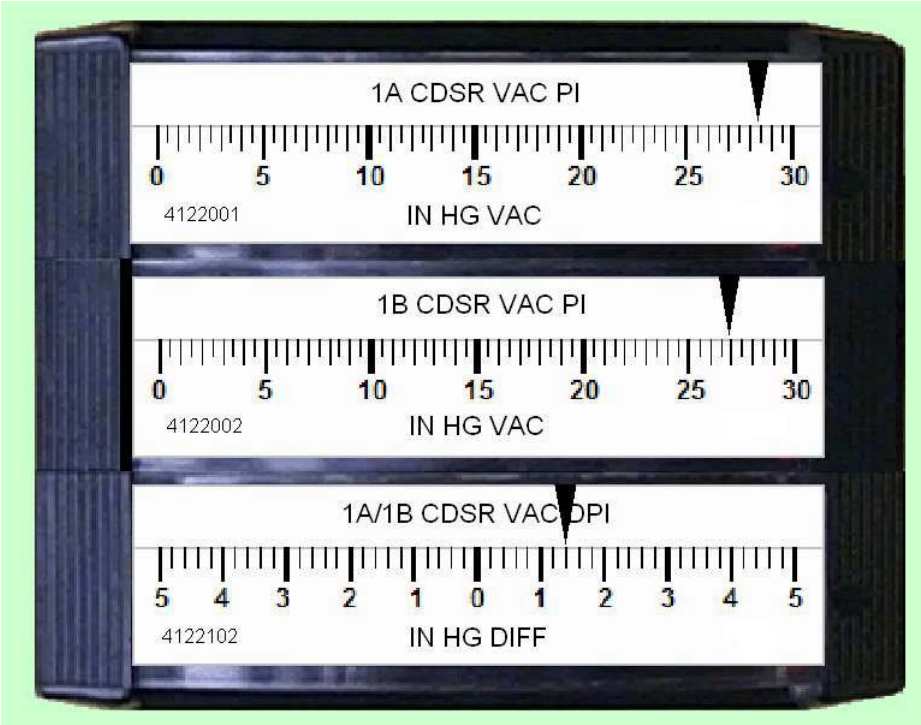
Question Cognitive Level:
Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 3
55.43 _____

Comments:

21. P8174L-005 029/51 AA2.02/3.9/6//P8100/FIG C1-20//2018 ILT NRC R21

- Unit 1 is at 100% power.




- FIG C1-20 Allowable Back Pressure Operating Region, is provided.

Condenser (1) is the most limiting, and the Reactor Operator (2) TRIP the reactor.

A. (1) 1A
(2) WILL

B. (1) 1A
(2) WILL NOT

C. (1) 1B
(2) WILL

D. ✔ (1) 1B
(2) WILL NOT

3-PEO

Justifications:
a. incorrect. Plausible if the examinee incorrectly believes that the highest vacuum is actually the highest pressure and most limiting AND that the examinee incorrectly believes that the differential pressure warrants a reactor trip.
b. incorrect. plausible if the examinee incorrectly believes that the highest vacuum is actually the highest pressure and thus most limiting.
c. incorrect. plausible if the examinee incorrectly believes the differential pressure warrants a reactor trip.
d. Correct.

K/A Number:
051 Loss of Condenser Vacuum
AA2.02:
Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Conditions requiring reactor and/or turbine trip.

K/A Value: 3.9

Technical Reference(s): FIG C1-20, C47008-0108

Proposed references to be provided to applicants during examination: FIG C1-20

Learning Objective: P8174L-005 Obj. 6

For the Main Turbine, recall precautions limitations and hazards associated with system operation their bases and required safety equipment.

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:

22. P8182L-002 059/061 2.1.32/3.8/6//P8100/C11//2018 ILT NRC R22

- Fuel is in the Spent Fuel enclosure.
- R-5, SFP Spent Fuel Pool Area Radiation Monitor, is OUT OF SERVICE.

Because radiation levels must be monitored_____(1)_____, a_____(2)_____ monitor will be installed.

A. (1) CONTINUOUSLY
(2) CONTINOUS AIR

B. ✔ (1) CONTINUOUSLY
(2) PORTABLE AREA

C. (1) INTERMITTENTLY
(2) CONTINOUS AIR

D. (1) INTERMITTENTLY
(2) PORTABLE AREA

*1-P*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that CAMs are the only equipment that qualify as continuous monitoring.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes that since the portable equipment does not alarm in the control room that it is considered intermittent monitoring and that a CAM is the preferred replacement for monitoring gasses released because of fuel damage.
d. Incorrect. Plausible if the examinee incorrectly believes that since the portable equipment does not alarm in the control room that it is considered intermittent monitoring.

K/A Number:
061 Area Radiation Monitoring (ARM) System Alarms
2.1.32:
Ability to explain and apply system limits and precautions.

K/A Value: 3.8

Technical Reference(s): C11 pg 35

Proposed references to be provided to applicants during examination: None

Learning Objective: P8182L-002 Obj. 6

For Radiation Monitors, recall precautions, limitations, and hazards associated Radiation Monitoring System operation, their bases and required safety equipment.

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 11
55.43 _____

Comments:

23. P8197L-008 016/068 AA1.29/3.6/5//P8100/2C1.3 AOP1/FIG C1-10B/2018 ILT NRC R23

- Unit 2 is being shutdown to MODE 3.
- RCS temperature is 515°F.

- The crew is on step 2.4.30 of 2C1.3 AOP1, Shutdown from Outside the Control Room - Unit 2.

- The latest RCS boron sample is 1000 ppm.
- Core exposure to date is 9,000 MWd/MTU.

- 2C1.3 AOP1 (excerpt) is provided.
- FIG C1-10B, Shutdown Boron Concentration Unit 2 Cycle 30, is provided.

The crew will add a MINIMUM of_____gallons of boric acid.

A. 500

B. 875

C. ✔ 1530

D. 1660

3-SPR
Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that 1 gallon boration increases RCS boron by 1.75 ppm
b. Incorrect. Plausible if examinee incorrectly believes that a 1 gallon boration will increase RCS boron by 1 ppm.
c. Correct.
d. Incorrect. Plausible if the examinee believes that the plant must be borated to the Mode 5 level to provide added safety margin.

K/A Number:
068 Control Room Evacuation
AA1.29:
Ability to operate and / or monitor the following as they apply to the Control Room Evacuation: Calculation of boron needed for xenon-free shutdown.

K/A Value: 3.6

Technical Reference(s): 2C1.3 AOP1 page 16 and Fig C1-10B

Proposed references to be provided to applicants during examination: 2C1.3 AOP1 page 16 and Fig C1-10B

Learning Objective: P8197L-008 Obj. 5

Explain the sequence of major steps in 2C1.3 AOP1.

Question Source: Bank # P8197L-008 016
Modified Bank # _____
New _____

Question History: Last NRC Exam 2017 LOR

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

10 CFR Part 55 Content:
55.41 5
55.43 _____

Comments:

24. P8197L-014 216/E06 EA2.2/3.6/3.8/16//P8100/FR-C.1//2018 ILT NRC R24

- The crew is performing step 18 of 1FR-C.1, Response to Inadequate Core Cooling.
- Containment is ADVERSE.
- BOTH RCPs are NOT RUNNING.

- Core exit thermocouples are 1358°F and RISING.
- 11 Steam Generator level is 40% WIDE RANGE.
- 12 Steam Generator level is 61% WIDE RANGE.

- 1FR-C.1 (excerpt) is provided.

The Reactor Operator will...

A. Start 11 RCP ONLY.

B. ✔ Start 12 RCP ONLY.

C. Start BOTH 11 and 12 RCPs.

D. OPEN BOTH Pressurizer PORVs.

*3-SPR*

Justifications:
a. incorrect. Plausible if the examinee incorrectly believes that the higher level in 12 SG is a result of swell and implies a lower pressure and introducing heat from the RCS will cause an unacceptable pressure transient.
b. correct.
c. Incorrect. Plausible if the examinee incorrectly believes that both SG have sufficient water level (using narrow range requirements) and the red path that caused entry into the FR procedures demands both RCPs should be started to remove heat from the core as fast as possible.
d. Incorrect. Plausible if the examinee incorrectly believes that neither SG has sufficient water level for starting an RCP without causing damage to the tubes.

K/A Number:
E06
EA2.2:
Ability to determine and interpret the following as they apply to the (Degraded Core Cooling) Adherence to appropriate procedures and operation within the limitation in the facility's license and amendments.

K/A Value: 3.5

Technical Reference(s): 1FR-C.1 pg 10

Proposed references to be provided to applicants during examination: 1FR-C.1 pg 10

Learning Objective: P8197L-014 Obj. 16

For FR-C.1, explain the purpose for any step or step sequence for associated E or FR series EOP.

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:

25. P8172L-001A 148/076 2.1.27/3.9/1//P8100/B12A//2018 ILT NRC R25

The purpose of the CATION BED DEMINERALIZER is to control pH and REMOVE...

A. river silt.

B. microbes.

C. ✔ fission products.

D. dissolved oxygen gas.

*1-B*

Justifications:
a. Incorrect. River silt is a significant issue for the station in the service water system. Plausible if the examinee incorrectly believes that it is also an issue in the primary coolant.
b. Incorrect. MIC is a significant issue in service water. Plausible if the examinee incorrectly believes there is industry OE of primary leakage due to MIC.
c. Correct. Per B12A, in the event of fuel element failure that would cause high coolant activity, the cation bed demin could be used to remove activity.
d. Incorrect. Oxygen scavenging is the purpose of the hydrogen in the gas space of the VCT. Plausible if the examinee incorrectly believes this is done in the purification system portion of CVCS.

K/A Number:
076 High Reactor Coolant Activity
2.1.27:
Knowledge of system purpose and/or function.

K/A Value: 3.9

Technical Reference(s): B12A pg 10

Proposed references to be provided to applicants during examination: None

Learning Objective: P8172L-001A Obj. 1

State the purpose of CVCS.

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 3
55.43 _____

Comments:

26. P8180L-007 106/E01 EK2.2/3.5/3//P8100/1E-0//2018 ILT NRC R26

- 11 Steam Generator is FAULTED.
- The crew is on Step 6.b of 1E-0, Reactor Trip or Safety Injection.
- AFW flow and pressures are as follows:


- 1E-0 (excerpt) provided.

The crew will THROTTLE...

A. OPEN MV-32238, 11 TD AFWP to 11 SG

B. OPEN MV-32381, 12 MD AFWP to 11 SG

C. CLOSE MV-32239, 11 TD AFWP to 12 SG

D.✔ CLOSE MV-32382, 12 MD AFWP to 12 SG

3-SPR

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes both SGs need to be above 200 gpm. This is wrong because 11 SG is faulted and AFW flow to 11 SG needs to be isolated.
b. Incorrect. Plausible if examinee incorrectly believes increases flow to 11 SG will increase pressure on 12 AFW Pump discharge.
c. Incorrect. Plausible as this will raise 11 AFW Pump discharge pressure; however, 12 AFW Pump discharge pressure is low instead of 11 AFWP.
d. Correct.

K/A Number:
E01 Rediagnosis
EK2.2:
Knowledge of the interrelations between the (Reactor Tip or Safety Injection/ Rediagnosis) and the following:
Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

K/A Value: 3.5

Technical Reference(s): 1E-0, pg 5

Proposed references to be provided to applicants during examination: 1E-0 pg 5

Learning Objective: P8180L-007 Obj. 3

For the auxiliary feedwater pump system valves, describe the normal values of significant indications and the relationships between values.

Question Source: Bank # P8180L-007 106
Modified Bank # _____
New _____

Question History: Last NRC Exam 2014 ILT (Similar) 2013 LOR

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

10 CFR Part 55 Content:
55.41 8
55.43 _____

Comments:

27. P8197L-014 217/E08 EK3.1/3.4/34//P8100/1FR-P.1//2018 ILT NRC R27

- The crew is performing 1FR-P.1, Response to Imminent Pressurized Thermal Shock Condition.
- A RCS temperature SOAK began 10 minutes ago.

Due to thermal stress in the____(1)____, the crew CAN NOT____(2)____RCS temperature.

A. (1) Reactor Vessel
(2) RAISE

B. ✔ (1) Reactor Vessel
(2) LOWER

C. (1) Steam Generator Tubes
(2) RAISE

D. (1) Steam Generator Tubes
(2) LOWER

*1-B*

Justifications:
a. Incorrect. Thermal stress in the reactor vessel is a concern during FR-P.1. Plausible if the examinee incorrectly believes that cyclical temperature changes after a rapid decrease would result in greater stress on the vessel.
b. Correct.
c. Incorrect. Rising temperature in the RCS will most likely create additional temperature gradient between RCS and SG's. Plausible if the examinee incorrectly believes that SGTR is the concern in 1FR-P.1.
d. Incorrect. The crew is not permitted to LOWER RCS temp during the soak per 1FR-P.1. Plausible if the examinee incorrectly believes that the steam generators NOT having a thermal gradient causes stress in the tubes and lead to tube rupture.

K/A Number:
E08 Pressurized Thermal Shock
EK3.1:
Knowledge of the reasons for the following responses as they apply to the (Pressurized Thermal Shock):
Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

K/A Value: 3.4

Technical Reference(s): 1FR-P.1 bases pg 9

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-014 Obj. 34

For 1FR-P.1, explain the purpose for any step or step sequence for associated E or FR series EOP.

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
55.43 _____

Comments:

28. P8184L-004 114/003 K3.04/3.6*/7//P8100/B8//2018 ILT NRC R28

- Unit 1 is at 70% power.

- 11 Reactor Coolant Pump TRIPS.
- NO Automatic actions occur.

The Reactor Operator will...

A. ✔ TRIP the reactor.

B. perform a RAPID DOWNPOWER.

C. START 12 Reactor Coolant Pump.

D. RESTART 11 Reactor Coolant Pump.

1-I

Justifications:
a. Correct.
b. Incorrect. Plausible if the examinee incorrectly confuses the response to RCP trip with a response to MFP trip.
c. Incorrect. Plausible if the examinee incorrectly confuses the response to RCP trip with response to CC pump trip.
d. Incorrect. Plausible if the examinee incorrectly believes that the RCP can be restarted once similar to resetting a GFCI.

K/A Number:
003 Reactor Coolant Pumps
K3.04:
Knowledge of the effect that a loss or malfunction of the RCPS will have on the following: RPS.

K/A Value: 3.6*

Technical Reference(s): B8 pg 8

Proposed references to be provided to applicants during examination: None

Learning Objective: P8184L-004 Obj. 7

Predict the response of the system to a loss of power.

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
55.43 _____

Comments:

29. P8172L-002 103/003 A2.01/3.5/8B//P8100/C47015-0108/1C14 AOP2/2018 ILT NRC R29

- Unit 1 is at 100% power.

- 47015-0108, 11 RCP THERMAL BARRIER CC WATER HI FLOW, is in ALARM.
- 11 CC Surge Tank level is RISING.
- CV-31245, 11 RC PUMP THERMAL BARRIER CLNT OUTL, is OPEN and cannot be closed automatically or manually.
- RCP Seal DPs are 705 psid, 747 psid, and 783 psid.

The crew will enter...

A. 1C3 AOP2, Loss of RCP Seal Cooling.

B. 1C3 AOP3, Failure of Reactor Coolant Pump Seal.

C. 1C12.1 AOP2, Loss of Charging Flow to the Regen HX.

D. ✔ 1C14 AOP2, Leakage Into the Component Cooling System.

*2-RI*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that CC is considered lost as the thermal barrier HX is leaking and that the Difference in DP for the seals indicates a seal is failed.
b. Incorrect. Plausible if the examinee incorrectly believes that the indicated DPs for RCP seals indicate a seal failure.
c. Incorrect. Plausible if the examinee incorrectly believes that the additional flow into the CC system is caused by charging flow being all diverted from the letdown HX to the RCP seals.
d. Correct.

K/A Number:
003 Reactor Coolant Pump
A2.01:
Ability to (a) predict the impacts of the following malfunctions or operations on the RCPs; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Problems with RCP seals, especially rates of seal leak-off

K/A Value: 3.5

Technical Reference(s): C47015-0108

Proposed references to be provided to applicants during examination: None

Learning Objective: P8172L-002 Obj. 8B

Given an operating experience (OE) related to the CC system, Identify how a similar event could be detected at PI.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam N/A

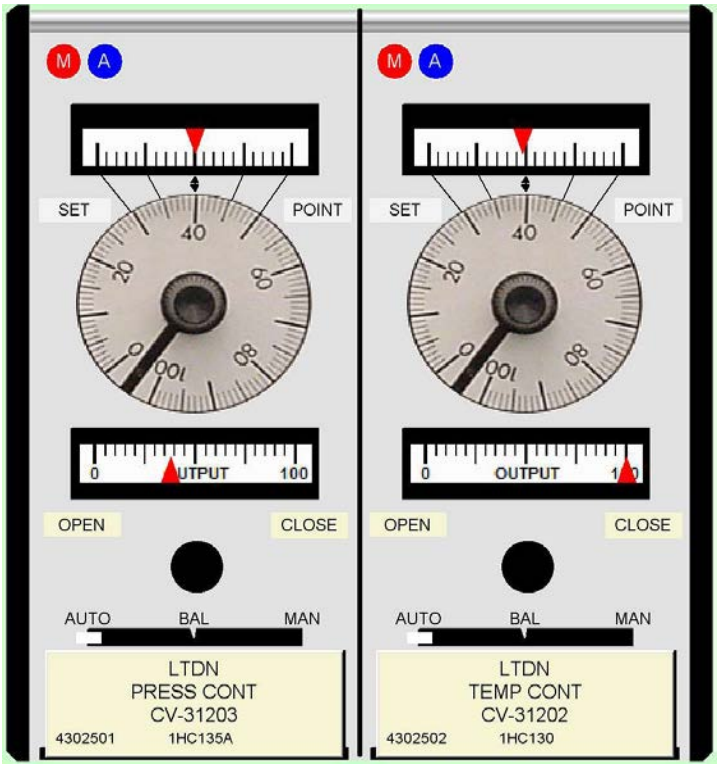
Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 10
55.43 _____

Comments:

30. P8172L-001A 040/004 K4.03/3.6/3.1/3E, 4B//P8100//C47015-0408/2018 ILT NRC R30

- Unit 1 is at 100% power.
- 1HC-130, 11 LTDN CC OUTL CV-31202 TEMP CONT STA, output fails to 100%.




As a result, LETDOWN temperature will ___(1)___ and the operator will be required to _____(2)_____.

A. (1) RISE
(2) BORATE per 1C12.5, Boron Concentration Control

B. ✔ (1) RISE
(2) verify CV-31204, LTDN DIVERT TO PURIF, in V.C. TNK position

C. (1) LOWER
(2) BORATE per 1C12.5, Boron Concentration Control

D. (1) LOWER
(2) verify CV-31204, LTDN DIVERT TO PURIF, in V.C. TNK position

3-SPR

Justification:
a. Incorrect. Plausible as this is the correct temperature trend, but the wrong mitigation action.
b. Correct. 1HC-130 output failing to 100% will result in CV-31202, 11 Letdown Heat Exchanger Temperature Control Valve, closing, causing the given transient.
c. Incorrect. Plausible as this is the correct response if it's assumed the temperature change has a significant effect on RCS temperature.
d. Incorrect. Plausible as this is the appropriate reaction to the casualty, but wrong trend on letdown temperature.

K/A Number:
004 Chemical and Volume Control System (CVCS)
K4.03:
Knowledge of the CVCS design feature(s) and/or Interlock(s) which provide for the following: Protection of ion exchangers (high letdown temperature will isolate ion exchangers).

K/A Value: 2.8

Technical Reference(s): 47015-0408

Proposed references to be provided to applicants during examination: None

Learning Objective: P8178L-001A Obj. 4B

For CVCS, describe the system flowpath and major components for abnormal operations.

Question Source: Bank # P8172L-001A
Modified Bank # _____
New _____

Question History: Last NRC Exam 2013 LOR, 2017 LOR RE-EXAM

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

10 CFR Part 55 Content:
55.41 3
55.43 _____

Comments:

31. P8140L-204 035/005 K5.03/2.9*/3//P8100/2C15//2018 ILT NRC R31

- RHR is being placed in service for Shutdown Cooling per 2C15, Residual Heat Removal System, Unit 2.
- Minimum Cold Shutdown boron concentration is 950 ppm.
- Samples give the following results:
  - RCS boron is 2025 ppm.
  - RHR boron is 1800 ppm.

Aligning RHR to Letdown will cause a____(1)____. Letdown will be directed to the____(2)____.

A. (1) DILUTION
(2) VCT

B. ✔ (1) DILUTION
(2) CVCS HUT

C. (1) BORATION
(2) VCT

D. (1) BORATION
(2) CVCS HUT

*2-DR*

Justification

a. Incorrect. A dilution will occur. Plausible if the examinee incorrectly believes that this is acceptable because current RHR boron levels are above minimum cold shutdown concentration.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes that the boron in the RHR system will be added to the boron in the RCS creating a higher concentration.
d. Incorrect. Plausible if the examinee incorrectly believes that the boron in the RHR system will be added to the boron in the RCS creating a higher concentration and this will create a scenario that will stress the purification system.

K/A Number:
005 Residual Heat Removal System (RHRS)
K5.03:
Knowledge of the operation implications of the following concepts as they apply to the RHRS: Reactivity effects of RHR fill water.

K/A Value: 2.9*

Technical Reference(s): 2C15 pg 10

Proposed references to be provided to applicants during examination: None

Learning Objective: P8140L-204 Obj. 3

For C15, Explain all notes and precautions.

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 1
55.43 _____

Comments:

32. P8180L-004 060/006 K6.03/3.6/10//P8100//TS 3.5.3/2018 ILT NRC R32

Per TS LCO 3.5.3, ECCS - Shutdown, in Mode (1), A Safety Injection train may be considered OPERABLE when the pump is capable of being manually STARTED (2).

A. (1) 3
(2) LOCALLY

B. (1) 3
(2) from the CONTROL ROOM

C. (1) 4
(2) LOCALLY

D. ✔ (1) 4
(2) from the CONTROL ROOM

*1-F*

Justifications:
a. incorrect. Plausible if the examinee incorrectly believes that SI pumps are not required in mode 4 and that as long as the pump can be started in any fashion it is considered operable.
b. Incorrect. Plausible if the examinee incorrectly believes that SI pumps are not required to be operable in mode 4.
c. Incorrect. Plausible if the examinee incorrectly believes that local manual operation is sufficient for equipment operability.
d. Correct.

K/A Number:
006 Emergency Core Cooling System (ECCS)
K6.03:
Knowledge of the effect of a loss or malfunction on the following will have on the ECCS:
Safety Injection Pumps.

K/A Value: 3.6

Technical Reference(s): TS 3.5.3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-004 Obj. 10

For Safety Injection, apply technical specifications.

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 6
55.43 _____

Comments:

33. P8170L-003 129/007 A1.01/2.9/3//P8100/C4/C47012-0406/2018 ILT NRC R33

- PRT level is 78% and Stable.
- 47012-0406, PRZR RELIEF HI TEMP/LVL/PRESS OR LO LVL is ALARMING.

To clear the alarm, the reactor operator will drain the PRT via (1) until PRT level is (2).

A. (1) 11 RMU Pump
(2) 72%

B. (1) 11 RMU Pump
(2) 5%

C. ✔ (1) 11 RCDT Pump
(2) 72%

D. (1) 11 RCDT Pump
(2) 5%

*3-SPK*

Justifications:
a. Incorrect. 72% is the correct level. Plausible if the examinee incorrectly believes the RMU system is an acceptable drain for the PRT since it is used to maintain inventory in the primary system.
b. Incorrect. Plausible if the examinee incorrectly believes that to clear the alarm, the PRT must be completely drained similar to a sump and that since it primary water, it can be drained to RMU, which is used to maintain inventory in the primary system.
c. Correct.
d. Incorrect. Plausible if examinee incorrectly believes that to clear the alarm, the PRT must be completely drained, similar to a sump.

K/A Number:
007 Pressurizer Relief Tank/Quench Tank System (PRTS)
A1.01:
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including:
Maintaining quench tank water level within limits.

K/A Value: 2.8

Technical Reference(s): 1C4 pg 4-5

Proposed references to be provided to applicants during examination: None

Learning Objective: P8170L-003 Obj. 3

For the PRT, describe control room controls and indications and normal values of significant indications and relationships between values.

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
55.43 _____

Comments:

34. P8172L-002 105/008 A2.01/3.3/5//P8100/1C14 AOP1//2018 ILT NRC R34

- Unit 1 is at 100% power.
- 11 CC Pump is OOS for corrective maintenance.

- 12 CC Pump LOCKS OUT.
- The crew is performing 1C14 AOP1, Loss of Component Cooling - Unit 1.

- 11 RCP HIGHEST bearing temperature is 205°F and RISING.
- 12 RCP HIGHEST bearing temperature is 257°F and RISING.

- 1C14 AOP1 (excerpt) is provided.

The Reactor Operator will...

A. START 12 CC Pump.

B. ACTUATE Safety Injection.

C. ✔ TRIP the Reactor THEN TRIP BOTH RCPs.

D. TRIP the Reactor THEN TRIP 12 RCP ONLY.

*3-SPR*

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes that CC pump lockout can be reset similar to AFW.
b. Incorrect. Plausible if the examinee incorrectly believes that the loss of cooling to letdown will require Safety Injection to cool the core.
c. Correct.
d. Incorrect. Plausible if examinee incorrectly believes that one pump is required to be maintained running in order to have core cooling.

K/A Number:
008 Component Cooling Water System (CCWS)
A2.01:
Ability to (a) predict the impacts of the following malfunctions or operation on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.

K/A Value: 3.3

Technical Reference(s): 1C14 AOP1 pg 5

Proposed references to be provided to applicants during examination: 1C14 AOP1 pg 5

Learning Objective: P8172L-002 Obj. 5

Describe the Component Cooling Flowpath for Abnormal Operations.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam N/A

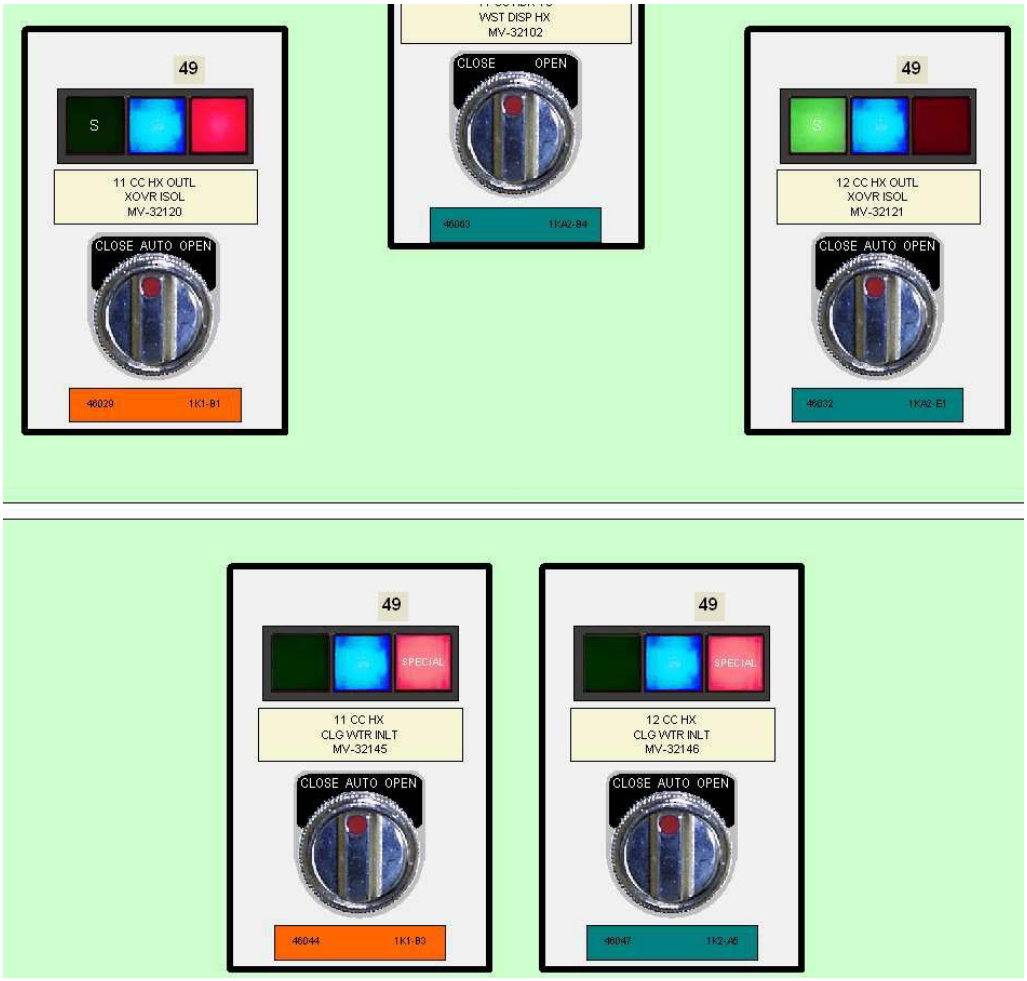
Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

35. P8172L-002 104/008 A3.04/2.9/5//P8100/B14//2018 ILT NRC R35

- Unit 1 is at 100% power.
- Safety Injection is ACTUATED.
- During the performance of Attachment L to 1E-0, Reactor Trip or Safety Injection, the following condition of the CC system is observed:




Which valve will the RO reposition?

A. MV-32145, 11 CC HX CLG WTR INLT

B. MV-32146, 12 CC HX CLG WTR INLT

C. ✔ MV-32120, 11 CC HX OUTL X OVR ISOL

D. MV-32121, 12 CC HX OUTL X OVR ISOL

3-SPR

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that both Train A valves should be in the same position.
b. Incorrect. Plausible if the examinee incorrectly believes that Train A serves one function and Train B serves a different function during an accident.
c. Correct.
d. Incorrect. Plausible if the examinee incorrectly believes that all four valves should be open on an SI.

K/A Number:
008 Component Cooling Water System
A3.04:
Ability to monitor automatic operation of the CCWS including::
Requirements on and for the CCWS for different conditions of the power plant.

K/A Value: 2.9

Technical Reference(s): B14 pg 23 and 30

Proposed references to be provided to applicants during examination: None

Learning Objective: P8172L-002 Obj. 5

Describe the Component Cooling Flowpath for Abnormal Operations.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam N/A

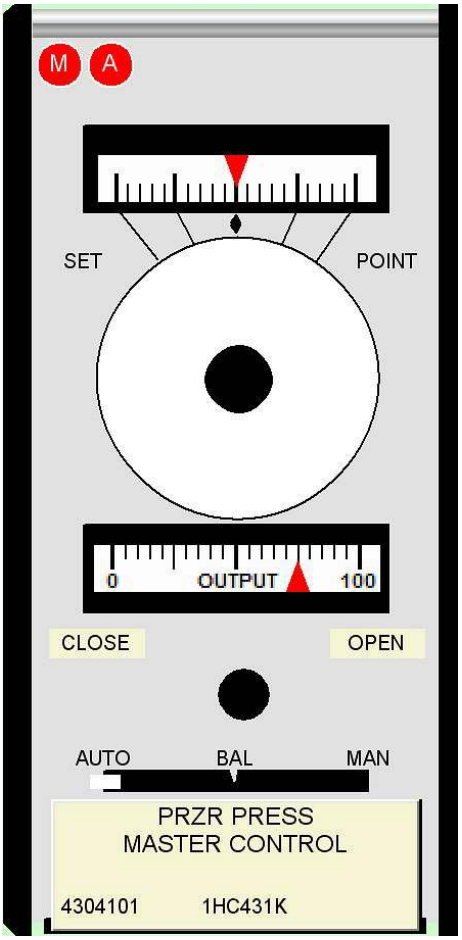
Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

36. P8170L-005 075/010 A3.02/3.0/3H//P8100/B7//2018 ILT NRC R36

- Pressurizer Backup Heaters are in AUTOMATIC.
- Pressurizer Spray Valves are in AUTOMATIC.
- 1HC-431K, Pressurizer Master Controller, is aligned as follows:




What is the status of Pressurizer Backup Heaters and Spray Valves?

| | Backup Heaters | Spray Valves |
|---|---|---|
| A. | OFF | CLOSED |
| B.✔ | OFF | ~50% OPEN |
| C. | ON | CLOSED |
| D. | ON | ~50% OPEN |

2-RI

Justifications:
a. Incorrect. Plausible if examinee looks at the setpoint error instead of output meter. The setpoint error is at 50% which corresponds to backup heaters being off and spray valves being closed.
b. Correct.
c. Incorrect. Plausible if examinee reverses the logic for when backup heaters energize and spray valves close.
d. Incorrect. Plausible as the spray valves are ~50% open; however, the backup heaters are off.

K/A Number:
010 Pressurizer Pressure Control
A3.02:
Ability to monitor automatic operation of the PZR PCS, including:
PZR pressure

K/A Value 3.0

Technical Reference(s): B7 pg 72

Proposed references to be provided to applicants during examination: None

Learning Objective: P8170L-005 Obj. 3H

For each of the major system components, describe the control room controls and indications.

Question Source: Bank # P8170L-005 075
Modified Bank # _____
New _____

Question History: Last NRC Exam 2014 ILT ADUIT

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

10 CFR Part 55 Content:
55.41 7
55.43 _____

Comments:

37. P8184L-004 115/012 A4.07/3.9/3//P8100/B5//2018 ILT NRC R37

- The crew is performing 1FR-S.1, Response to Nuclear Power Generation/ATWS.
- The Reactor Trip Breakers are CLOSED.
- The Reactor Operator is INSERTING Control Rods.

- An operator successfully locally opened rod drive MG set motor and generator breakers.

What is the position shown on SHUTDOWN BANK A RPI?
What is the status of REACTOR POWER?

| | SHUTDOWN BANK A RPI | REACTOR POWER |
|---|---|---|
| A.✔ | 0 | LESS THAN 5% |
| B. | 0 | GREATER THAN 5% |
| C. | 228 | LESS THAN 5% |
| D. | 228 | GREATER THAN 5% |

1-I

Justifications:

When the MG set breakers are open; rods will drop, rod bottom lights will be lit, RPI will read 0, step counters will remain at their demand level.

a. Correct.
b. Incorrect. RPI will be 0. Plausible if the examinee incorrectly believes that only shutdown banks are inserted and remaining banks will keep power above 5%.
c. Incorrect. Reactor power will be less than 5%. Plausible if the examinee incorrectly believes that RPI shows the demand level from Rod control.
d. Incorrect. Plausible if the examinee incorrectly believes that opening MG set breakers will prevent rod motion and trip breaker opening.

K/A Number:
012 Reactor Protection System
A4.07:
Ability to manually operate and/or monitor in the control room:
m/g set breakers.

K/A Value: 3.9

Technical Reference(s): B5 pg 16

Proposed references to be provided to applicants during examination: None

Learning Objective: P8184L-004 Obj. 3

For the reactor trip switchgear, describe the local controls and indications.

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 6
55.43 _____

Comments:

38. P8180L-006 051/013 2.4.46/4.2/4//P8100/1E-0 ATT L//2018 ILT NRC R38

- A Large Break LOCA has occurred.
- Safety Injection was manually actuated.
- Containment pressure is 22 psig.
- BOTH MSIVs are CLOSED.


Per 1E-0, Reactor Trip or Safety Injection, Attachment L, The Reactor Operator will...

A. RESET SAFETY INJECTION.

B. RESET CONTAINMENT ISOLATION.

C. ACTUATE CONTAINMENT ISOLATION.

D.✔ ISOLATE INSTRUMENT AIR TO CONTAINMENT.

2-DR

Justifications:
a. Incorrect. SI could be reset during 1E-0. Plausible if the examinee incorrectly believes that since resetting SI is done right before restoring instrrment air to containment, SI needs to be reset to support Isolation of instrument air.
b. Incorrect. Plausible if the examinee incorrectly believes that only a partial CI has occurred and that CI must be reset so that it can be actuated again.
c. Incorrect. Plausible if the examinee incorrectly believes that CI has not actuated.
d. Correct.

K/A Number:
013 Engineered Safety Features Actuation System (ESFAS)
2.4.46:
Ability to verify that the alarms are consistent with the plant conditions.

K/A Value: 4.2

Technical Reference(s): 1E-0 Att L pg 1 and 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-006 Obj. 4

For Containment Isolation, describe the system flowpath and major components for emergency operations.

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:

39. P8440L-401C 006/022 K1.04/2.9*/3E//P8100//NF-86186/2018 ILT NRC R39

- 11 and 21 Containment and Auxiliary Building Chillers are RUNNING.
- All Containment Fan Coils Units (CFCUs) for both Units are aligned to CHILLED WATER.

- Unit 1 Safety Injection is Actuated.

- NF-86186-3 and NF-86186-4, Interlock Logic Diagram-Containment and Auxiliary Building Chilled Water System are provided.

What is the source of cooling for Unit 1 and Unit 2 CFCUs?

| | Unit 1 CFCUs | Unit 2 CFCUs |
|---|---|---|
| A. | Chilled Water | Chilled Water |
| B. | Chilled Water | Cooling Water |
| C. | Cooling Water | Chilled Water |
| D.✔ | Cooling Water | Cooling Water |

*3-PEO*

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes that CFCUs only switch to cooling water on a LOOP.
b. Incorrect. Plausible if the examinee incorrectly believes that the opposite unit CFCUs switch to cooling water to reduce the load on chilled water.
c. Incorrect. Plausible if examinee incorrectly believes that only the unit with the SI switches over to cooling water.
d. Correct.

K/A Number:
022 Containment Cooling
K1.04:
Knowledge of the physical connections and/or cause-effect relationships between the CCS and the following systems:
Chilled water.

K/A Value: 2.9*

Technical Reference(s): NF-86186-3,4

Proposed references to be provided to applicants during examination: NF-86186-3, -4

Learning Objective: P8440L-401C Obj. 3E

For the Aux Building and Containment Chillers, describe the automatic actions including starts, trips, and interlocks and their set points.

Question Source: Bank # _____
Modified Bank # P8440L-401C 005
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 4
55.43 _____

Comments:

40. P8180L-002 077/026 K2.01/3.4/3C//P8100/B18D//2018 ILT NRC R40

- Unit 1 Safety Injection is ACTUATED.
- Containment Spray is ACTUATED.

- 11 Charging Pump is RUNNING.
- 12 and 13 Charging Pump are in STANDBY.
- 12 Containment Spray Pump is LOCKED OUT.
- 11 and 21 Cooling Water Pumps are RUNNING.
- 121 Instrument Air Compressor is the TRIM compressor.

- Bus 15 locks out.

Unit 1 will lose...

A. Charging Pump flow.

B. ✔ Containment Spray flow.

C. Cooling Water header pressure.

D. Instrument Air header pressure.

*2-RI*

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes that 11 charging pump is powered from Bus 15.
b. Correct.
c. Incorrect. Cooling water does contain safeguards pumps. Plausible if examinee incorrectly believes that safeguards cooling water pumps are powered by bus 15.
d. Incorrect. 121 IA compressor is powered from bus 15. Plausible if examinee incorrectly believes the header isolation valves will close on loss of bus 15.

K/A Number:
026 Containment Spray System (CSS)
K2.01:
Knowledge of bus power supplies to the following:
CS Pumps

K/A Value: 3.4

Technical Reference(s): B18D page 5

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-002 Obj. 3C

For the Containment Spray system major components, describe the power supplies.

Question Source: Bank # _____
Modified Bank # P8180L-003 072
New _____

Question History: Last NRC Exam 2016 ILT (Sig Mod)

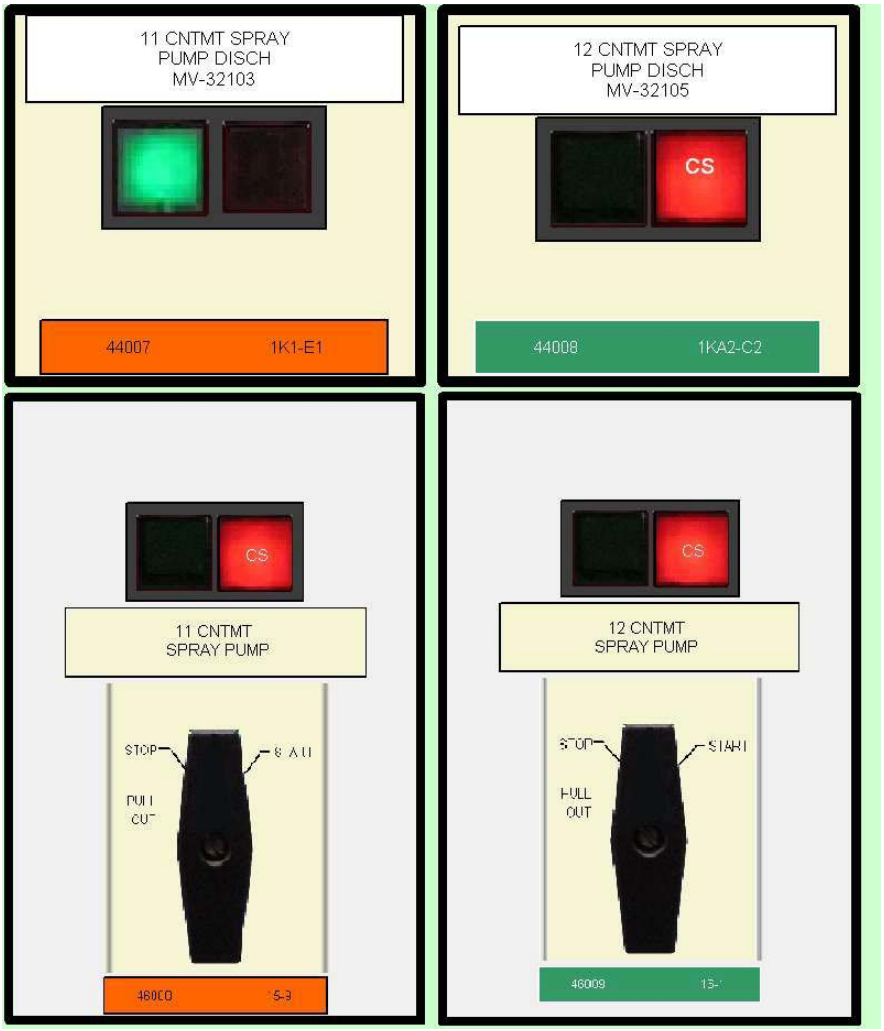
Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 7
55.43 _____

Comments:

41. P8180L-002 050/026 A4.01/4.5/4.B./N0/P8100/1E-0//2018 ILT NRC R41

- Containment pressure is 26 psig.
- Containment spray has ACTUATED.




- 1E-0, Reactor Trip or Safety Injection, (excerpt) is provided.

What action will the Reactor Operator take?

A. Reset Containment Spray

B. Manually start 11 Containment Spray Pump

C. ✔ Place 11 Containment Spray Pump in PULLOUT

D. Place 12 Containment Spray Pump in PULLOUT

3-SPK

Justifications:
a. Incorrect. Plausible if manual start of containment spray pumps had already been attempted.
b. Incorrect. Plausible if examinee incorrectly believes pump start is tied to discharge valve failure.
c. Correct.
d. Incorrect. Plausible if MV-32105 failed to open.

K/A Number:
026 Containment Spray System (CSS)
A4.01:
Ability to manually operate and/or monitor in the control room:
CSS controls.

K/A Value: 4.5

Technical Reference(s): 1E-0 Attachment L pg 4

Proposed references to be provided to applicants during examination: 1E-0 Attachment L, pg 4

Learning Objective: P8180L-002 Obj. 4B

Describe the system flowpath and major components for Emergency Operations.

Question Source: Bank # _____
Modified Bank # P8180L-002 043
New _____

Question History: Last NRC Exam 2016 ILT (SIG MOD)

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

10 CFR Part 55 Content:
55.41 8
55.43 _____

Comments:

42. P8174L-001 042/039 K3.03/3.2/4//P8100/1E-2//2018 ILT NRC R42

- 11 Steam Generator is FAULTED.
- 12 Steam Generator is INTACT.

- MV-32016, 11 MAIN STM TO 11 TD AFWP, is OPEN.
- MV-32017, 12 MAIN STM TO 11 TD AFWP, is OPEN.

The Reactor Operator will...

A. NOT close either valve.

B. ✔ CLOSE MV-32016 ONLY.

C. CLOSE MV-32017 ONLY.

D. CLOSE BOTH MV-32016 and MV-32017.

*2-RI*

Justification:
a. Incorrect. Plausible if the examinee incorrectly believes that the faulted SG is still capable of providing steam to the TDAFW.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes that the valve is closed to conserve level in the 12 SG until 11 is dry, then it is reopened.
d. Incorrect. Plausible if the examinee incorrectly believes that lines are equalized and both valves must be closed to prevent 12 from being bled through the fault in 11. This is similar in principle to how MSIVs are operated when a turbine control/safety valve is stuck open.

K/A Number:
039 Main and Reheat Steam System (MRSS)
K3.03:
Knowledge of the effect that a loss or malfunction of the MRSS will have on the following:
AFW Pumps.

K/A Value: 3.2

Technical Reference(s): 1E-2 pg 4

Proposed references to be provided to applicants during examination: None

Learning Objective: P8174L-001 Obj. 4

Describe the Main Steam flow path for emergency operations.

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 11
55.43 _____

Comments:

43. P8174L-001 043/039 K3.03////P8100/1C1.2 BOP//2018 ILT NRC R43

- Unit 1 Startup is IN PROGRESS.

The main steam line HEAT UP RATE shall NOT exceed_____per hour.

A. ✔ 100°F

B. 230°F

C. 300°F

D. 547°F

1-P

Justification:
a. Correct.
b. Incorrect. Plausible if the examinee incorrectly believes that the exhaust temperature of the turbine is the heat up rate for the steam line.
c. Incorrect. Plausible if the examinee incorrectly believes that the low pressure turbine metal temperature is an indication of the heat up rate of the steam lines.
d. Incorrect. Plausible if the examinee incorrectly believes Tref is an indication of the heat up rate of the steam lines.

K/A Number:
039 Main and Reheat Steam System (MRSS)
2.1.23:
Ability to perform specific system and integrated plant procedures during all modes of plant operation.

K/A Value: 4.3

Technical Reference(s): 1C1.2-BOP pg 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8174L-001 Obj. 5

Recall precautions, limitations, and hazards associated with system operation, their bases and required safety equipment.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam NA

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

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

44. P8174L-003 083/059 K4.02/3.3/3.5/OBJ 7////B23/2018 ILT NRC R44

- Unit 1 is at 75% power.

Tripping BOTH Main Feedwater Pumps will cause an AUTOMATIC TRIP of...

A. NEITHER the Reactor NOR the Turbine.

B. the Turbine ONLY.

C. the Reactor ONLY.

D. ✔ BOTH the Reactor and Turbine.

*1-I*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that procedurally a rapid downpower is directed which would the correct action if only one feedpump tripped.
b. Incorrect. Plausible if the examinee incorrectly believes that a reactor trip is not required at this power level.
c. Incorrect. Plausible if the examinee incorrectly believes that the turbine is required to run to supply steam to the TDAFWP.
d. Correct.

K/A Number:
059 Main Feedwater System
K4.02:
Knowledge of the MFW design feature(s) and/or interlock(s) which provide for the following: Automatic turbine/reactor trip runback.

K/A Value: 3.3

Technical Reference(s): B23 pg 21-22

Proposed references to be provided to applicants during examination: None

Learning Objective: P8174L-003 Obj. 7

For the Main Feedwater system, predict the response of the system to a component failure.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam N/A

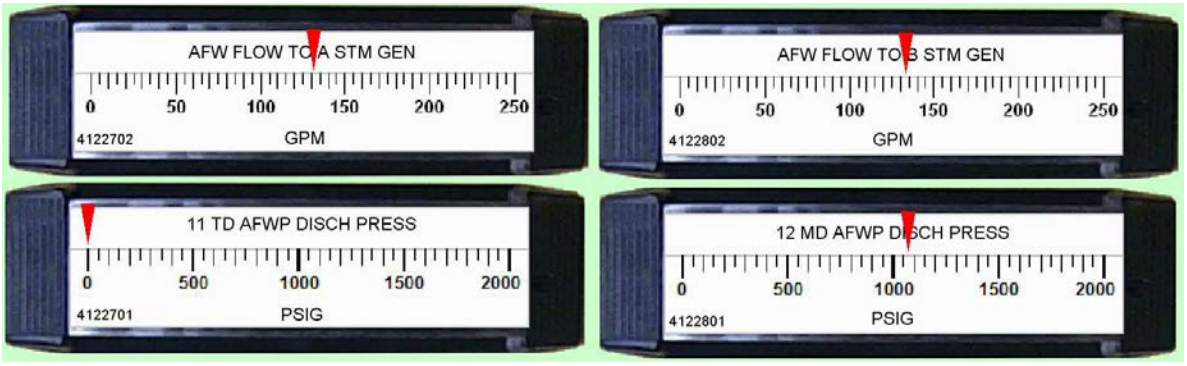
Question Cognitive Level:
Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

45. P8180L-007 228/061 K5.03/2.6/3H//P8100/1E-0//2018 ILT NRC R45

- 11 Steam Generator is FAULTED.




- The Reactor Operator closes MV-32381, 12 MD AFWP to 11 SG.

What is the impact on 12 MD AWFP DISCHARGE PRESSURE and AFW FLOW TO B STEAM GENERATOR?

| | 12 MD AFWP DISCH PRESS | AFW FLOW TO B STM GEN |
|---|---|---|
| A.✔ | RISE | RISE |
| B. | RISE | LOWER |
| C. | LOWER | RISE |
| D. | LOWER | LOWER |

3-SPK

Justifications:
a. Correct.
b. Incorrect. Plausible if examinee incorrectly believes that closing the valve will choke flow from the pump rather than force additional flow through the other SG.
c. Incorrect. Plausible if the examinee incorrectly believes the pressure gage is downstream of the valve being closed.
d. Incorrect. Plausible if examinee incorrectly believes the pressure gage is downstream of the valve being closed and that valve is choking off all discharge flow to the SG.

K/A Number:
061 Auxiliary/Emergency Feedwater
K5.03:
Knowledge of the operational implications of the following concepts as they apply to the AFW: Pump head effects when control valve is shut.

K/A Value: 2.6

Technical Reference(s): 1E-0 Bases pg 3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-007 Obj. 3H

For Aux Feedwater Pumps, describe the control room controls and indications.

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 4
55.43 _____

Comments:

46. P8186L-002 036/062 K1.04/3.7/4.2/2//P8100/B20.2//2018 ILT NRC R46

- The substation is in its NORMAL lineup.
- Breaker 8H7 LOCKS OUT.
- B20.2, Substation, (excerpt) is provided.

Which incoming 345 KV line will be isolated?

A. Hampton

B. Red Rock #1

C. ✔ Red Rock #2

D. North Rochester

*3-SPR*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes this 345KV line is "shed" due to the loss of 345KV bus.
b. Incorrect. Plausible if the examinee incorrectly confuses 8H7 with 8H17.
c. Correct.
d. Incorrect. Plausible if the examinee incorrectly confuses 8H7 with 8H9.

K/A Number:
062 AC Electrical Distribution
K1.04:
Knowledge of the physical connections and/or cause-effect relationships between the ac distribution system and the following systems:
Off-site power sources.

K/A Value: 3.7

Technical Reference(s): B20.2 pg 18

Proposed references to be provided to applicants during examination: B20.2 pg 18

Learning Objective: P8186L-002 Obj. 2

Draw a basic switchyard system diagram.

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:

47. P8186L-003B 012/062 K4.03/2.8*/7//P8100/P8186L-003B/B20.6/2018 ILT NRC R47

- Both units are at 100% power.
- Bus 420 is being powered by Bus 320.
- Breaker BT-3242 is CLOSED.

- Bus 320 LOCKS OUT.

BT-3242 (1) open AUTOMATICALLY, and Bus 420 will be (2) re-powered from D4.

A. (1) WILL
(2) MANUALLY

B. ✔ (1) WILL
(2) AUTOMATICALLY

C. (1) WILL NOT
(2) MANUALLY

D. (1) WILL NOT
(2) AUTOMATICALLY

*2-DR*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that BKR 42-2 does not close automatically.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes that since bus 310 and 410 are still powered, no automatic actions occur.
d. Incorrect. Plausible if the examinee incorrectly believes that since the bus is locked out rather than just tripped, that the BT does not have to open automatically and that Bus 320 will not see voltage.

K/A Number:
062 AC Electrical Distribution
K4.03:
Knowledge of the AC distribution system design features and/or interlocks which provide the following:
Interlocks between automatic bus transfer and breakers.

K/A Value: 2.8

Technical Reference(s): P8186L-003B pg 17

Proposed references to be provided to applicants during examination: None

Learning Objective: P8186L-003B Obj. 7

Predict the system response to a component failure.

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 4
55.43 _____

Comments:

48. P8186L-005 043/063 A1.01/2.5/12//P8100/P8186L-005//2018 ILT NRC R48

- Station Blackout has occurred.
- 11 Battery is discharging at 125.5 amps.

- Several loads are removed from the battery.

After loads are removed, discharging amps will indicate (1) and the battery will maintain voltage for a (2) amount of time.

A. (1) HIGHER
(2) LONGER

B. (1) HIGHER
(2) SHORTER

C. ✔ (1) LOWER
(2) LONGER

D. (1) LOWER
(2) SHORTER

*1-T*

Justification

a. Incorrect. Removing Loads does cause discharge time to increase. Plausible if candidate incorrectly believes that both battery amperage and voltage rise when loads are removed AND believes that amperage is a measure of potential energy.
b. Incorrect. If Amperage were to increase, that would cause discharge time to lower. Plausible if candidate incorrectly believes that battery amperage and voltage rise when loads are removed.
c. Correct. 11 Battery now has fewer loads resulting in a lower discharge rate and associated higher time to completely discharge.
d. Incorrect. Amperage will lower when loads are removed. Plausible if the examinee incorrectly believes that amperage is a measure of potential energy.

K/A Number:

063 DC Electrical Distribution
A1.01:
Ability to predict and/or monitor changes in parameters associated with operating the DC electrical system controls including:
Battery capacity as it is affected by discharge rate.

K/A Value: 2.5

Technical Reference(s): P8186L-005 pg 10

Proposed references to be provided to applicants during examination: None

Learning Objective: P8186L-005 Obj. 12

For the battery, describe the computer indications.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content:
55.41 7
55.43 _____

Comments:

49. P8186L-004 049/064 K2.01/2.7/3.1/3//P8100/P8186L-004//2018 ILT NRC R49

- Bus 12 is LOCKED OUT.

What is the status of D1 and D2 Starting Air Compressors?

| | D1 Starting Air Compressor | D2 Starting Air Compressor |
|---|---|---|
| A.✔ | AVAILABLE | AVAILABLE |
| B. | AVAILABLE | NOT AVAILABLE |
| C. | NOT AVAILABLE | AVAILABLE |
| D. | NOT AVAILABLE | NOT AVAILABLE |

1-I

Justifications:
a. Correct. Starting Air Compressors are powered from safeguards busses.
b. Incorrect. Plausible if the examinee incorrectly believes that D2 SAC is powered from bus 12 because it is a B train bus in the plant's numbering scheme.
c. Incorrect. Plausible if the examinee incorrectly believes that bus 12 is a secondary bus for A train equipment.
d. Incorrect. Plausible if the examinee incorrectly believes that because of the compressed air tanks, the air compressors are both powered from bus 12 because they are not safeguards equipment and that cooling water pumps starting air compressors are powered from bus 11.

K/A Number:
064 Emergency Diesel Generator
K2.01:
Knowledge of bus power supplies to the following:
Air Compressor.

K/A Value: 2.7

Technical Reference(s): P8186L-004 pg 15

Proposed references to be provided to applicants during examination: None

Learning Objective: P8186L-004 Obj. 3

For the D1 diesel generator, describe the starting air compressor power source.

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:

50. P8186L-004 050/064 A2.03/3.1/6//P8100/1C20.7//2018 ILT NRC R50

- D1 Emergency Diesel Generator is RUNNING.
- The crew is performing step 5.1.2 of 1C20.7, D1/D2 Diesel Generators, to synchronize and load D1.
- BKR 15-2, BUS 15 SOURCE FROM D1 DSL GEN, is CLOSED.

- D1 DID NOT pick up load.

- 1C20.7 (excerpt) is provided.

The Reactor Operator will...

A. ✔ RAISE SPEED.

B. LOWER SPEED.

C. RAISE VOLTAGE.

D. LOWER VOLTAGE.

3-SPR

Justifications:
a. Correct.
b. Incorrect. Generator speed will impact the amount of load picked up by the generator. Plausible if the examinee incorrectly believes that lowering speed will cause the generator to have to work harder by picking up load.
c. Incorrect. Plausible if the examinee incorrectly believes that exciter control adjustment will cause the diesel to pick up real load.
d. Incorrect. Plausible if the examinee incorrectly believes that lowering voltage will cause the diesel to increase power to maintain constant current.

K/A Number:
064 Emergency Diesel Generator
A2.03:
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:
Parallel operation of ED/G.

K/A Value: 3.1

Technical Reference(s): 1C20.7 pg14

Proposed references to be provided to applicants during examination: 1C20.7 pg 12-15.

Learning Objective: P8186L-004 Obj. 6

Recall precautions, limitations, and hazards associated with system operation, their bases and required safety equipment.

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:

51. P8182L-002 094/073 A4.02/3.7/3H//P8100/C21.1-5.1//2018 ILT NRC R51

- The crew is testing R-18, Waste Liquid Disposal Liquid Effluent Monitor.
- R-18 background reading in step 5.4.2 is 400 CPM.
- The crew is on Step 5.4.4 of C21.1-5.1, 121 ADT Monitor Tank Release.


What is the R-18 Check Source reading minus background?

A. $8.0 \times 10^1$

B. $4.8 \times 10^2$

C. ✔ $5.6 \times 10^3$

D. $6.0 \times 10^3$

3-SPK

Justifications:
a. Incorrect. Plausible if examinee incorrectly uses narrow range values.
b. Incorrect. Plausible if examinee incorrectly uses only narrow range check source for final value.
c. Correct. $6.0 \times 10^3 - 4 \times 10^2$ (6000-400) = $5.6 \times 10^3$
d. Incorrect. Plausible if examinee incorrectly uses only wide range check source for final value.

K/A Number:
073 Process Radiation Monitoring
A4.02:
Ability to manually operate and/or monitor in the control room:
Radiation monitoring system control panel.

K/A Value: 3.7

Technical Reference(s): C21.1-5.1 pg. 9;

Proposed references to be provided to applicants during examination: None

Learning Objective: P8182L-002 Obj. 3H

For the radiation monitor, describe control room controls and indications.

Question Source: Bank # _____
Modified Bank # P8182L-002 091
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 13
55.43 _____

Comments:

52. P8176L-003 085/076 A3.02/3.7/4//P8100/B35//2018 ILT NRC R52

- Unit 1 Safety Injection is ACTUATED.


Based ONLY on the above information, Cooling Water loops____(1)____ SEPARATED, and the Reactor Operator will operate____(2)____.

A. (1) ARE
(2) MV-32036

B. ✔ (1) ARE
(2) MV-32037

C. (1) ARE NOT
(2) MV-32036

D. (1) ARE NOT
(2) MV-32037

3-SPK

Justifications:
a. Incorrect. Loops are separated. Plausible if the examinee incorrectly believes they should not be separated.
b. Correct. ABCD valves are required to close on SI and align the 121 MDCLP to the unit with the SI and to separate trains to ensure adequate water flow to emergency heat loads even with postulated failure of one loop.
c. Incorrect. Plausible if the examinee incorrectly believes the valves are in parallel in the plant and 32036 should be opened to allow maximum amount of cross flow.
d. Incorrect. Plausible if the examinee incorrectly believes the valves are in parallel, but recognizes that loops must be separated.

K/A Number:
076 Service Water System (SWS)
A3.02:
Ability to monitor automatic operation of the SWS, including:
Emergency heat loads

K/A Value: 3.7

Technical Reference(s): B35 pg 19

Proposed references to be provided to applicants during examination: None

Learning Objective: P8173L-003 Obj. 4

Describe the system flowpath and major components for emergency operations.

Question Source: Bank # _____
Modified Bank # _____
New X

Question History: Last NRC Exam N/A

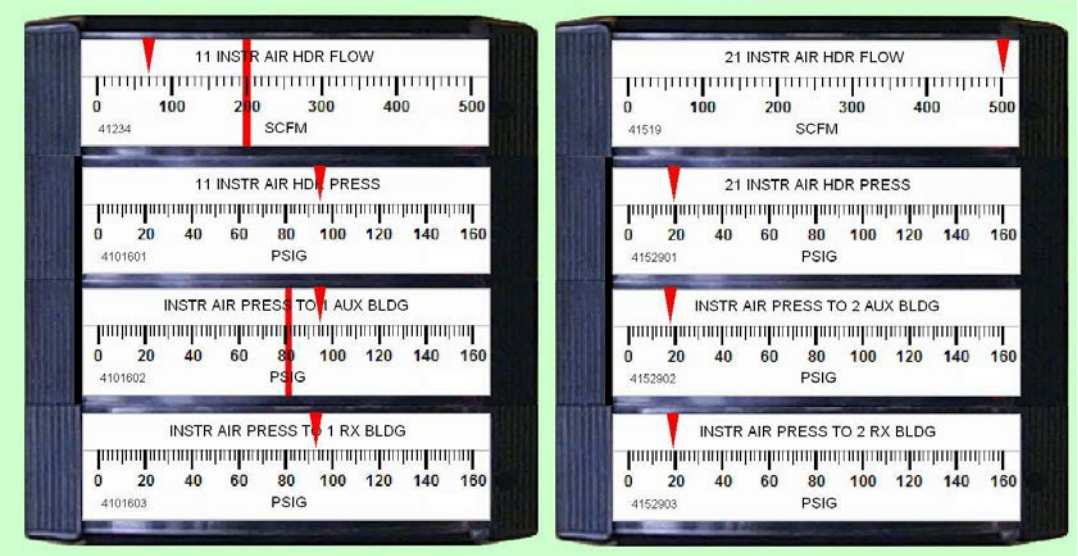
Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

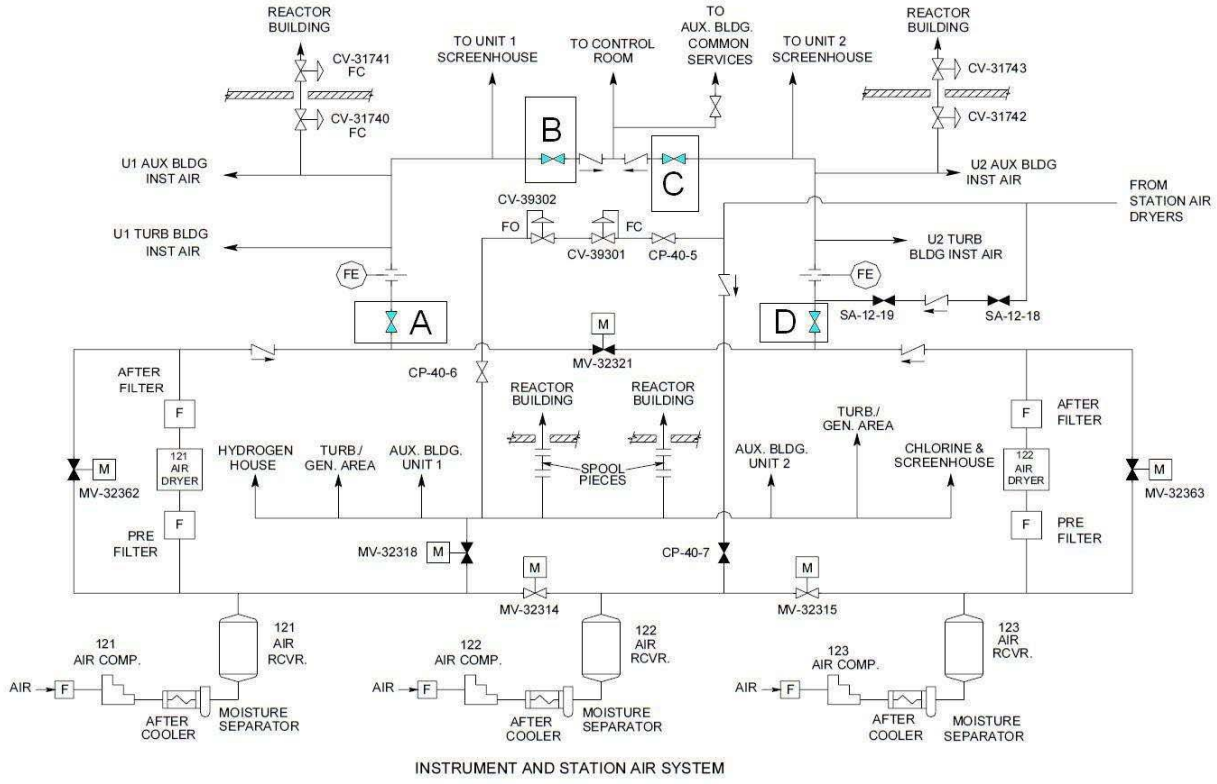
10 CFR Part 55 Content:
55.41 7
55.43 _____

Comments:

53. P8178L-005 055/078 2.4.47/4.2/4.2/7C//P8100/NF-39244/B34/2018 ILT NRC R53

- A leak has occurred in the Instrument Air System.




INSTRUMENT AND STATION AIR SYSTEM

Question continued on next page.

53. P8178L-005 055/078 2.4.47/4.2/4.2/7C//P8100/NF-39244/B34/2018 ILT NRC R53

Question continued from previous page.

Which valve will isolate the leak?

A. A

B. B

C. C

D. ✔ D

*3-SPR*

Justifications:
a. Incorrect. Plausible if examinee misdiagnoses leak location is on the Unit 1 side.
b. Incorrect. Plausible if examinee misdiagnoses leak location is on the Unit 1 side, incorrectly believes air flow from valve A side is automatically isolated, and believes check valve next to valve B is allowing backflow from Unit 2.
c. Incorrect. Plausible if the leak location is diagnosed correctly, but incorrectly believe air flow from valve D side is automatically isolated and believes the check valve next to valve C is allowing backflow from Unit 1
d. Correct. Unit 2 side air pressure being low and Unit 2 side air flow being high indicates the leak is on the Unit 2 side. Also Unit 1 air pressure and flow are close to normal. Valve D being closed would isolate the air leak.

K/A Number:
078 Instrument Air System (IAS)
2.4.47:
Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

K/A Value: 4.2

Technical Reference(s): B34 pg 20, P8178L-005 pg 44.

Proposed references to be provided to applicants during examination: None

Learning Objective: P8178L-005 Obj. 7C

Predict the response of the Instrument and Station Air system to decreasing header pressure.

Question Source: Bank # _____
Modified Bank # P8178L-005 049
New _____

Question History: Last NRC Exam 2014 ILT (sig mod) 2013 Biennial (Sig Mod) 2012 ILT Audit (Sig Mod)

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

10 CFR Part 55 Content:
55.41 4
55.43 _____

Comments:

54. P8180L-001 037/103 K1.05/2.8*/10//P8100/TS 3.6.1 BASES/TS 3.6.2 BASES/2018 ILT NRC R54

- Unit 1 is in MODE 1.

- The OUTER door on the personnel air lock is INOPERABLE.
- The INNER door on the personnel air lock is MANUALLY LOCKED CLOSED.

Is TS LCO 3.6.1, Containment, MET?
Is TS LCO 3.6.2, Containment Air Locks, MET?

| | TS LCO 3.6.1 Containment | TS LCO 3.6.2 Containment Air Locks |
|---|---|---|
| A. | MET | MET |
| B. ✔ | MET | NOT MET |
| C. | NOT MET | MET |
| D. | NOT MET | NOT MET |

*2-RI*

Justifications:
a. Incorrect. 3.6.1 is met. Plausible if the examinee incorrectly believes that since the inner door is operable, 3.6.2. is met similarly to 3.6.1.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes that only one door set is required to be operable for 3.6.2 to be met in this mode, but containment is not operable in mode 1 with one set of doors inoperable.
d. Incorrect. 3.6.2 is not met. Plausible if the examinee incorrectly believes that 3.6.2 cascades into 3.6.1 with one door out of service.

K/A Number:
103 Containment System
K1.05:
Knowledge of the physical connections and / or cause-effect relationships between the containment system and the following systems:
Personnel access hatch and emergency access hatch.

K/A Value: 3.7

Technical Reference(s): TS 3.6.1. and 3.6.2. and bases.

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-001 obj 10

Apply technical specifications for containment.

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 _____

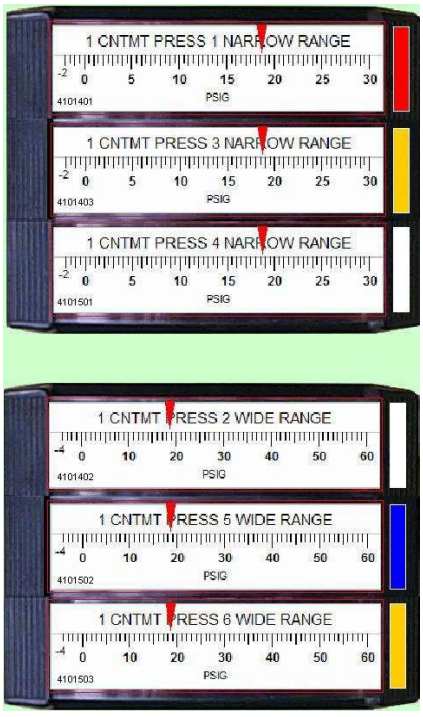
Comments:

55. P8180L-002 024/103 A1.01/3.7/3//P8100/XH-1-242//2018 ILT NRC R55

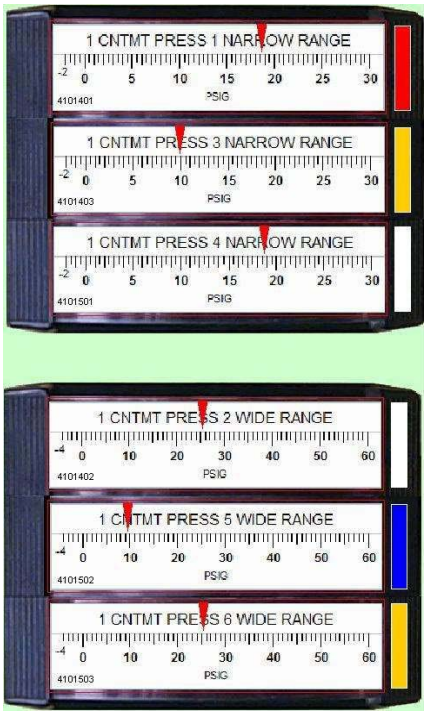
- XH-1-242, Safeguards Actuation Signals Logic Diagrams, is provided.

Which set of Containment Pressures will generate a 'P' signal?

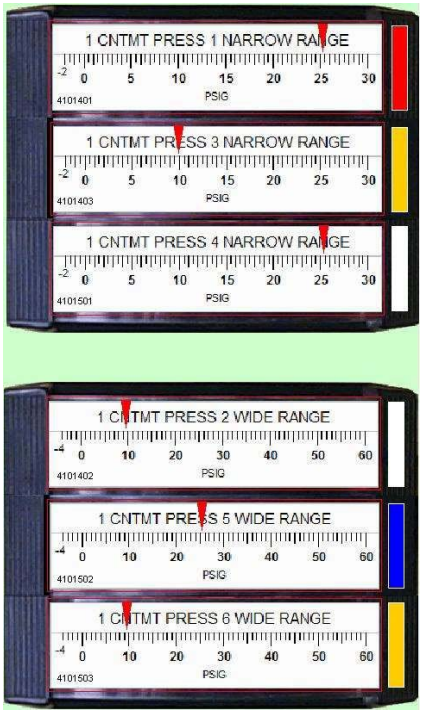
A.



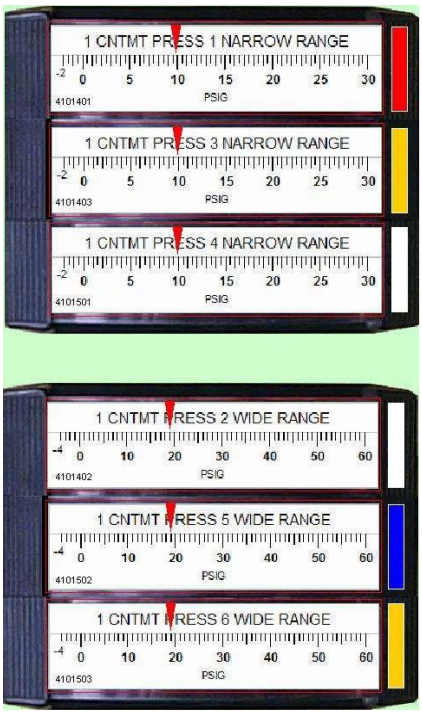

B.




C.✔




D.



2-DR

Justifications
a. Incorrect. Plausible if candidate confuses 'P' signal (23 psig) with MSIV closure at 17 psig.
b. Incorrect. Plausible as four indicators are above 23 psig; however, 1/2 3 times is not met.
c. Correct.
d. Incorrect. Plausible if candidate understands logic (1/2 3 times), but believes the setpoint is 17 psig.

K/A Number:
103 Containment System
A1.01:
Ability to predict and / or monitor changes in parameters (to prevent exceeding design limits) associated with operating the containment system controls including:
Containment pressure, temperature and humidity.

K/A Value: 3.7

Technical Reference(s): XH-1-242

Proposed references to be provided to applicants during examination: XH-1-242

Learning Objective: P8180L-002 Obj. 3

For Containment Spray, describe the automatic functions including starts, trips, and interlocks and their set points.

Question Source: Bank # P8180L-002 024
Modified Bank # _____
New _____

Question History: Last NRC Exam 2015 LOR

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

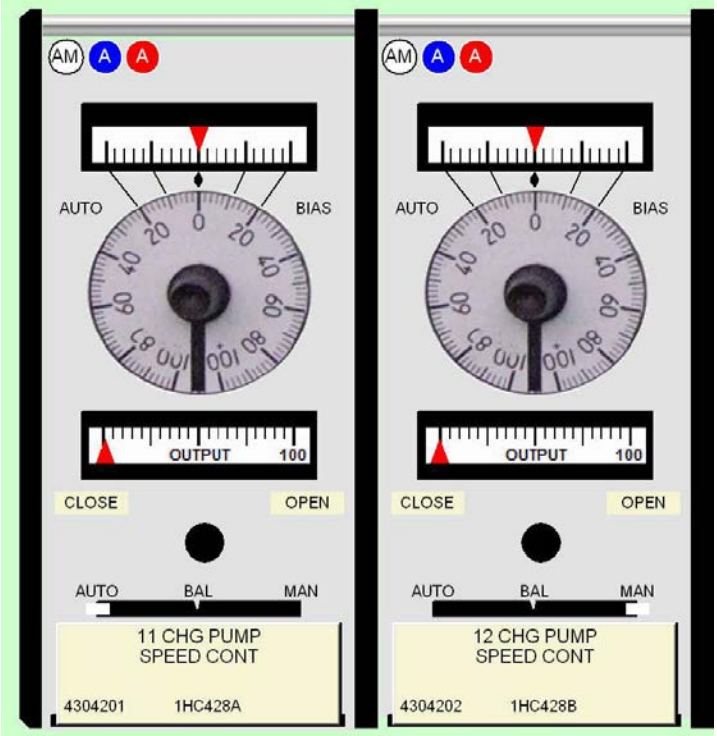
10 CFR Part 55 Content:
55.41 7
55.43 _____

Comments:

56. P8170L-006 068/011 A2.03/3.8/7//P8100/C47012-0507//2018 ILT NRC R56

- Unit 1 is at 100% power.
- 11 and 12 charging pump are RUNNING.

- 47012-0507, PRZR LVL DEVIATION, is ALARMING.
- Pressurizer Level is 21%.
- ALL channels of Pressurizer Level indication are in AGREEMENT.




- C47012-0507 is provided.

The Reactor Operator will...

A. place bistables in TRIP within 6 hours.

B. place 12 Charging pump in AUTOMATIC.

C. TRIP the Reactor AND ACTUATE Safety Injection.

D.✔ place 11 Charging pump in MANUAL and RAISE Output.

*3-SPK*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes an instrument failure has occurred.
b. Incorrect. Plausible if the examinee incorrectly believes that placing 12 charging pump in automatic will allow the automatic control to return the level to program level.
c. Incorrect. Plausible if the examinee incorrectly believes a LOCA has occurred based on lowering pressurizer level.
d. Correct.

K/A Number:
011 Pressurizer Level Control
A2.03:
Ability to (a) predict the impacts of the following malfunctions or operations on the RCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Loss of PRZR level.

K/A Value: 3.8

Technical Reference(s): C47012-0507

Proposed references to be provided to applicants during examination: C47012-0507

Learning Objective: P8170L-006 Obj. 7

Predict the response of the pressurizer level control system to a component failure.

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:

57. P8184L-002 026/015 K3.01/3.9///P8100/1C51.1//2018 ILT NRC R57

- Unit 1 is at 100% power.
- N41 is FAILED LOW.

The reactor will...

A. ✔ NOT automatically trip.

B. trip when BISTABLES are tripped.

C. trip when CONTROL power fuses are removed.

D. trip when INSTRUMENT power fuses are removed.

1-I

Justifications:
a. Correct.
b. Incorrect. Bistables are tripped during 1C51.1. Plausible fi the examinee incorrectly believes that tripping bistables will trip the plant.
c. Incorrect. Removing control power fuses is performed during 1C51.1. Removing control/instrument power fuses causes alarms for channel alert for reactor trips to come in. This action would also cuase a reactor trip is done of the wrong NI. Plausible if the examinee incorrectly believes that channel alerts for high and low flux rate in at the same time will cause a reactor trip.
d. Incorrect. Removing control power fuses is performed during 1C51.1. Removing control/instrument power fuses causes alarms for channel alert for reactor trips to come in. This action would also cuase a reactor trip is done of the wrong NI. Plausible if the examinee incorrectly believes that channel alerts for high and low flux rate in at the same time will cause a reactor trip.

The reactor will not trip on a single NI failure. Multiple failures or other mitigating circumstances would create a reactor trip.

K/A Number:
015 Nuclear Instrumentation System
K3.01:
Knowledge of the effect that a loss or malfunction of the NIS will have on the following:
RPS.

K/A Value: 3.9

Technical Reference(s): 1C51.1

Proposed references to be provided to applicants during examination: None

Learning Objective: P8184L-002 Obj. 7

Predict the response of the system to a component failure.

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 11
55.43 _____

Comments:

58. P8180L-008 007/028 K3.01/3.3/4//P8100/1E-1//2018 ILT NRC R58

- Unit 1 was operating at 100% power.
- Unit 1 Reactor tripped due to a LOCA.
- Containment hydrogen concentration is 9%.

The crew will _____(1)_____ hydrogen recombiner(s) in service because _____(2)_____.

A. (1) place
(2) a hydrogen burn is NOT possible

B. (1) place
(2) a flammable situation is NOT imminent

C. (1) NOT place
(2) there is insufficient oxygen concentration for the recombiner to be effective

D.✔ (1) NOT place
(2) a hydrogen burn could occur causing an excessive rise in containment pressure

*2-DR*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes steam in containment will prevent hydrogen from burning.
b. Incorrect. Plausible if the examinee incorrectly believes H2 concentration is too high for flammability.
c. Incorrect. Plausible if the examinee incorrectly believes H2 concentration displaces enough O2 concentration to prevent operation of the recombiner.
d. Correct. H2 burn is possible at greater than or equal to 6%.

K/A Number:
028 Hydrogen Recombiner and Purge Control
K3.01:
Knowledge of the effect that a loss or malfunction of the HRPS system will have on the following:
Hydrogen concentration in containment

K/A Value: 3.3

Technical Reference(s): 1E-1 bases.

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-008 Obj. 4

State the conditions of H2 in air that present a combustible mixture.

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 9
55.43 _____

Comments:

59. P8182L-004 029/033 K4.01/3.1/5//P8100/C16 AOP1//2018 ILT NRC R59

Per C16 AOP1, what BORATED water source can be used to directly makeup to the SPENT FUEL PIT?

A. Demin Hose Stations

B. ✔ CVCS Hold-up Tanks

C. Reactor Coolant System

D. Condensate Storage Tanks

*1-F*

Justifications:
a. Incorrect. This is a source that can be used to makeup to the SFP. Plausible if the examinee incorrectly believes that Demin water is borated.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes that RCS inventory can be sacrificed to prevent loss of level in the SFP because of the high volume of water that can be quickly added to the RCS.
d. Incorrect. Plausible if the examinee incorrectly believes that CSTs provide makeup to all non-RCS sources.

K/A Number:
033 Spent Fuel Pool Cooling System (SFPCS)
K4.01:
Knowledge of the design feature(s) and/or interlock(s) which provide for the following:
Maintenance of Spent Fuel Pool Level.

K/A Value: 3.1

Technical Reference(s): C16 AOP1 pg 6

Proposed references to be provided to applicants during examination: None

Learning Objective: P8182L-004 Obj. 5

State the functional interrelationship between the Spent Fuel Pool Cooling System and the CVCS.

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 4
55.43 _____

Comments:

60. P8174L-001 027/035 K6.02/3.1/6//P8100/B27//2018 ILT NRC R60

The LOWEST design pressure setpoint for a STEAM GENERATOR SAFETY valve to open is approximately...

A. 745 psig.

B. ✔ 1077 psig.

C. 1830 psig.

D. 2235 psig.

*1-I*

Justification:
a. Incorrect. Plausible if the examinee incorrectly believes that safety valves are used to maintain pressure at 100% power.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes that SI actuates based on high steam generator pressure rather than low RCS pressure.
d. Incorrect. Plausible if the examinee incorrectly believes that the purpose of the safety is to ensure that pressure stays below RCS pressure to allow the SG to remove heat from the RCS.

It is noted that the KA refers to a PROV. A failed closed PORV with increasing pressure will result in a safety lifting. This question tests the set point at which that occurs which is the effect that a loss or malfunction a PORV would have on the SG.

K/A Number:
035 Steam Generator System
K6.02:
Knowledge of the effect of a loss or malfunction on the following will have on the S/GS:
Secondary PORV.

K/A Value: 3.1

Technical Reference(s): B27 pg 6

Proposed references to be provided to applicants during examination: None

Learning Objective: P8174L-001 Obj. 6

Predict the response to the system to a component failure.

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 4
55.43 _____

Comments:

61. P8174L-002 090/041 A1.02/3.1/4//P8100/B7//2018 ILT NRC R61

What is the MINIMUM amount of vacuum in the condenser shells for the condenser steam dump permissive to be satisfied?

A. 0" Hg

B. 2.5" Hg

C. ✔ 15" Hg

D. 30" Hg

*1-I*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that purpose of the vacuum interlock is to ensure motive force to move steam and that the condensers must not be pressurized.
b. Incorrect. Plausible if examinee incorrectly believes that the purpose of the vacuum interlock is to prevent differential pressure in the condensers.
c. Correct. Knowing this setpoint for steam pressure in the condensers is important to being able to monitoring the availability of steam dumps.
d. Incorrect. Plausible if the examinee incorrectly believes near perfect vacuum is required to draw steam from steam generators in absence of an on-line turbine.

K/A Number:
041 Steam Dump System and Turbine Bypass Control
A1.02:
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SDS controls including:
Steam Pressure.

K/A Value: 3.1

Technical Reference(s): B7 pg 20

Proposed references to be provided to applicants during examination: None

Learning Objective: P8174L-002 Obj. 4

Describe the operation of Steam Dumps in Tavg Mode.

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 4
55.43 _____

Comments:

62. P8182L-002 090/071 A3.03/3.6/5//P8100/B11//2018 ILT NRC R62

- A release of 126 and 124 Waste Gas Decay Tanks is in progress.
- 1R-30, U1 AUX BUILDING VENT, FAILS HIGH.
- No operator actions occur.

What is the status of 121/122 Aux Building Special Vent (ABSV) and the release?

| | 121 ABSV | 122 ABSV | Release Status |
|---|---|---|---|
| A. | RUNNING | RUNNING | OCCURRING |
| B. | RUNNING | NOT RUNNING | TERMINATED |
| C.✔ | NOT RUNNING | RUNNING | OCCURRING |
| D. | NOT RUNNING | NOT RUNNING | TERMINATED |

*2-RI*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that wither train of rad monitor will start both trains of ABSV.
b. Incorrect. Plausible if the examinee incorrectly believes that 1R-30 automatically terminates a WG release and is the train A monitor.
c. Correct.
d. Incorrect. Plausible if the examinee incorrectly believes that both 1R-30 and 2R-30 will terminate the release but only 2R-30 will start ABSVS.

K/A Number:
071 Waste Gas Disposal
A3.03:
Ability to monitor automatic operation of the Wast Gas Disposal System including:
Radiation monitoring system alarm and actuating signals.

K/A Value: 3.6

Technical Reference(s): B11 pg 18, 19

Proposed references to be provided to applicants during examination: None

Learning Objective: P8182L-002 Obj. 5

State the functional interrelationship between the Radiation Monitoring System and the Aux Building Normal and Special Ventilation.

Question Source: Bank # _____
Modified Bank # P8178L-001A 059
New _____

Question History: Last NRC Exam 2016 ILT (Sig Mod)

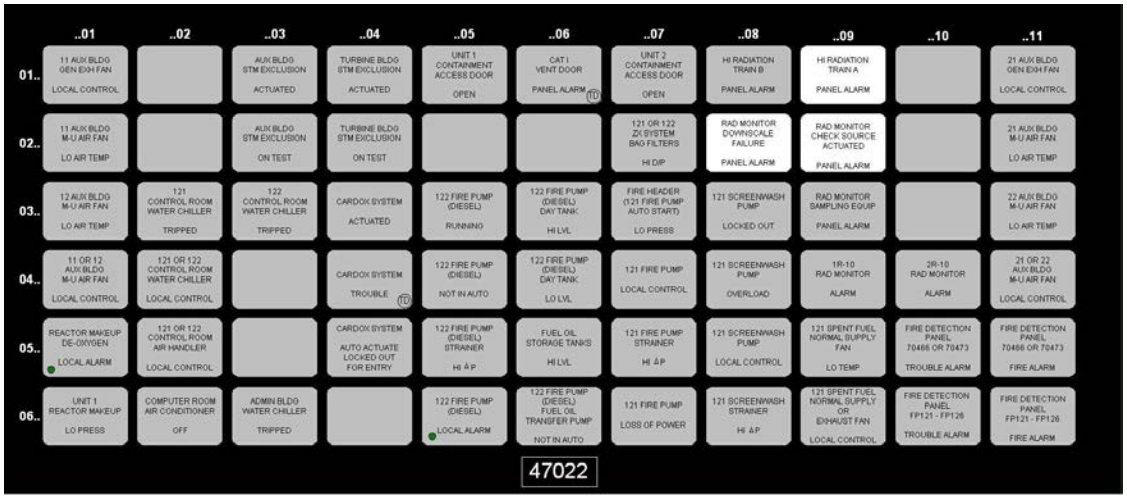
Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 12
55.43 _____

Comments:

63. P8182L-002 019/072 A4.03/3.1/3//P8100/SP1783.1A//2018 ILT NRC R63

- 2R-7, U2 IN-CORE SEAL AREA RADIATION MONITOR, is being calibrated per SP1783.1A, Westinghouse Radiation Monitor Electronic Calibration Train "A".




- SP1783.1A (excerpt) is provided.

The alarming annunciators...

A. ✔ are expected.

B. indicate a FAILED calibration.

C. indicate a valid radiation alarm.

D. indicate an internal detector failure.

1-I

Justifications:
a. Correct.
b. Incorrect. Plausible if the examinee incorrectly believes that 0208 indicates an unsuccessful calibration when paired with the check source.
c. Incorrect. Plausible if the examinee incorrectly believes that 0109 is not expected and that another detector has alarmed.
d. Incorrect. Plausible if the examinee incorrectly believes that 0208 is not expected during the calibration and that it indicates an actual internal circuitry failure.

K/A Number:
072 Area Radiation Monitoring (ARM) System
A4.03:
Ability to manually operate and/or monitor in the control room:
Check source for operability demonstration.

K/A Value: 3.1

Technical Reference(s): SP1783.1A pg 6

Proposed references to be provided to applicants during examination: SP1783.1A pg 6

Learning Objective: P8182L-002 Obj. 3

For the Radiation Monitors, describe the Control Room controls and indications.

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:

64. P8176L-002A 024/075 2.1.24/3.9/3//P8100/C25/PINGP 0045/2018 ILT NRC R64

- It is May 15.
- Plant DH is 2.8 feet.
- The 6 foot sluice gate is the ONLY sluice gate OPEN.
- Condenser inlet temperatures are 80°F.

- Recycle gates are adjusted.
- Plant DH is 2.4 feet.
- Plant DT is LESS THAN 5°F.

- PINGP 45, External Circ Water Log, is provided.
- C25 Figure 1, Circulating Water System, is provided.

An NPDES permit violation ____(1)____ occurred. Megawatts will ____(2)____.

A. (1) HAS
(2) RISE

B. (1) HAS
(2) LOWER

C. (1) HAS NOT
(2) RISE

D. ✔ (1) HAS NOT
(2) LOWER

3-SPR

a. Incorrect. Plausible if the examinee incorrectly believes that 2.7 is outside the NPDES permit and that MW will RISE because of the warmer circ water temp.
b. Incorrect. Plausible if the examinee incorrectly believes that 2.7 Dh is outside the NPDES Permit..
c. Incorrect. Plausible if the examinee incorrectly believes that MW will Rise due to the warmer water in the circ water system.
d. Correct.

K/A Number:
075 Circulating Water
2.1.25:
Ability to interpret reference materials, such as graphs, curves tables, etc.

K/A Value: 3.9

Technical Reference(s): PINGP 0045 C25 Figure 1

Proposed references to be provided to applicants during examination: PINGP 0045 C25 FIG 1

Learning Objective: P8176L-002A Obj. 4E

For each of the major system components of the Circulating water system, describe the normal values of significant indications and relationship between values.

Question Source: Bank # _____
Modified Bank # P8176L-002A 002 and 023
New _____

Question History: Last NRC Exam 2017 LOR

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

10 CFR Part 55 Content:
55.41 10
55.43 _____

Comments:

65. P8178L-005 008/079 K1.01/3.0/3//P8100/B34//2018 ILT NRC R65

Valve CP-40-7, STATION AIR RCVR X-CONN TO INST AIR, is located in the_____Building.

A. SHIELD

B. ✔ TURBINE

C. REACTOR

D. AUXILIARY

*1-F*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes the cross connect is downstream of the containment isolation valves to pressurize the piping across the containment boundary to maintain containment operable, similar to cooling water during cooling water leaks.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes the purpose of the cross connect is to supplement instrument air during high demand outages without compromising the air pressure to the operating unit.
d. Incorrect. Plausible if the examinee incorrectly believes the cross over valve is near where the lines enter containment to ensure that in the event of a turbine building leak, air can be supplied to containment.

K/A Number:
079 Station Air System
K1.01:
Knowledge of the physical connections and/or cause-effect relationships between the SAS and the following systems:
IAS.

K/A Value: 3.0

Technical Reference(s): B34 pg 20

Proposed references to be provided to applicants during examination: None

Learning Objective: P8178L-005 Obj. 3

For the Instrument Air System, for each of the major system components describe the location.

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 4
55.43 _____

Comments:

- Unit 1 is at 70% power.
- A 4% up-power was completed one hour ago.
- ERCS is OOS.

- Control Bank D Individual Rod Positions are as follows:
  - G3 is at 155 steps
  - C7 is at 153 steps
  - G11 is at 129 steps
  - K7 is at 143 steps

- Table 1 of SP 1669, ERCS Computer Out of Service Log, has been filled out as follows:

**Table 1 ERCS Computer Out of Service Log**

| | ROD BANK POSITIONS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bank Positions Verified > Minimum Rod Height Per Fig. C1-8 or Tech Spec COLR | Rod to Bank Deviation Verified Within Limits of T.S.3.1.4 | CONTROL BANKS | | | | | | SHUTDOWN BANKS | | |
| | | | A | | B | C | | D | A | | B |
| | | | Gp1 41103 | Gp2 41107 | Gp1 41104 | Gp1 41105 | Gp2 41108 | Gp1 41106 | Gp1 41100 | Gp2 41102 | Gp1 41101 |
| | | | STEPS | STEPS | STEPS | STEPS | STEPS | STEPS | STEPS | STEPS | STEPS |
| 0600 | | | 228 | 228 | 228 | 228 | 228 | 154 | 228 | 228 | 228 |
| 0700 | | | | | | | | | | | |

- FIG C1-8 is provided.
- TS LCO 3.1.4 (excerpt) is provided.

What is the status of the following limits?

| | Rod Insertion Limits | Rod to Bank Deviation Limits of T.S. 3.1.4 |
|---|---|---|
| A. | MET | MET |
| B.✔ | MET | NOT MET |
| C. | NOT MET | MET |
| D. | NOT MET | NOT MET |

3-SPR

Justifications:
a. Incorrect. Plausible as the Rod Insertion Limits are met; however, Rod to Bank Deviation Limits are NOT met.
b. Correct.
c. Incorrect. Plausible if examinee incorrectly believes rod G11 is inoperable, in which case RIL would not be met based on COLR.
d. Incorrect. Plausible as Rod to Bank Deviation Limits are NOT met; also if examinee incorrectly believes rod G11 is inoperable, in which case RIL would not be met based on COLR.

K/A Number:
Conduct of Operations
2.2.18:
Ability to make accurate, clear, and concise logs, records, status boards, and reports.

K/A Value: 3.6

Technical Reference(s): Fig. C1-8; TS 3.1.4

Proposed references to be provided to applicants during examination: Fig. C1-8; and T.S. 3.1.4 pg. 1

Learning Objective: P8184L-005 obj. 10

For Rod Control and RPI, Apply Technical Specifications to given plant conditions to determine required actions.

Question Source: Bank # _____
Modified Bank # _PI-OPS-GFE-038L 020_
New _____

Question History: Last NRC Exam _2015 LOR, 2014 ILT (sig mod)_____

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

10 CFR Part 55 Content:
55.41 6__
55.43 _____

Comments:

67. P8140L-233 006/2.1.7/4.4/B.3//P8100/1E-1//2018 ILT NRC R67

- The crew is on step 11 of 1E-1, Loss of Reactor or Secondary Coolant, to determine if Safety Injection flow should be TERMINATED.

- RCS pressure is 1200 psig and STABLE.
- RCS subcooling is 87°F.
- Total feedflow to intact Steam Generators is 400 gpm.
- BOTH Steam Generator narrow range levels are 25% and STABLE.
- Pressurizer level is 1% and STABLE.
- Containment is NOT ADVERSE

Will the Reactor Operator STOP RHR and/or SI pumps?

| | RHR | SI |
|---|---|---|
| A. | NO | NO |
| B. | NO | YES |
| C.✔ | YES | NO |
| D. | YES | YES |

*3-SPK*

Justifications:
a. Incorrect. Plausible if examinee incorrectly believes that break has not been isolated.
b. Incorrect. Plausible if examinee incorrectly believes that SI flow refers only to SI pumps.
c. Correct.
d. Incorrect. Plausible if examinee believes that SI should be secured per step 11 of 1E-1.

K/A Number:
2.1.7:
Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

K/A Value: 4.4

Technical Reference(s): 1E1 pg 6 and 7

Proposed references to be provided to applicants during examination: None

Learning Objective: P8140L-233 Obj. B.3

For 1E-1 explain the purpose of and describe desired end-point of plant conditions.

Question Source: Bank # X
Modified Bank # _____
New _____

Question History: Last NRC Exam 2017 LOR, 2016 ILT (Sig Mod)

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

10 CFR Part 55 Content:
55.41 3
55.43 _____

Comments:

68. P8180L-002 053/2.1.28/4.1/1///TS LCO 3.6.6//2018 ILT NRC R68

Per TS LCO 3.6.6. Bases, the purpose for adding sodium hydroxide to the containment spray flow is to...

A. ✔ enhance iodine absorption capacity of the spray.

B. add negative reactivity to the containment sump.

C. prevent overcooling containment.

D. limit containment pressure rise.

1-B

Justifications:
a. Correct.
b. Incorrect. Plausible if the examinee incorrectly believes that NaOH is being used as a poison similar to boron.
c. Incorrect. Plausible if the examinee incorrectly believes NAOH in CS is used to combat pressurized thermal shock.
d. Incorrect. Plausible if the examinee incorrectly believes that NaOH is part of the strategy to reduce containment pressure. This is a function of spray flow, but is not related to NaOH.

K/A Number:
2.1.28:
Knowledge of the purpose and function of major system components and controls.

K/A Value: 4.1

Technical Reference(s): TS LCO 3.6.6 bases

Proposed references to be provided to applicants during examination: None

Learning Objective: P8178L-001 obj 1

State the purpose of the Containment Spray system.

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
55.43 _____

Comments:

69. P8186L-005 105/2.2.36/3.1/4.2/10//P8100/T.S 3.8.4//2018 ILT NRC R69

- Unit 2 is in Mode 3.
- 21 DC Battery Charger is OOS.
- The Portable Battery Charger has been installed to replace 21 DC Battery Charger.

The Portable Battery Charger ____(1)____ a qualified backup equipment.
TS LCO 3.8.4, DC Systems - Operating, is ____(2)____.

A. ✔ (1) IS
(1) MET

B. (1) IS
(2) NOT MET

C. (1) IS NOT
(2) MET

D. (1) IS NOT
(2) NOT MET

3-SPK

Justification:

a. Correct.
b. Incorrect. Plausible if it is assumed the installed battery chargers are required even if the portable is qualified..
c. Incorrect. Plausible as T.S. is met, but if examinee does not recognize the portable is qualified.
d. Incorrect. Plausible as T.S. would not be met if the portable were not qualified equipment.

2.2.36:
Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

K/A Value: 3.1

Technical Reference(s): T.S 3.8.4 bases

Proposed references to be provided to applicants during examination: None

Learning Objective: P8186L-005 Obj 10d

Determine the basis for technical specification requirements.

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:

70. P8180L-009H 020/2.2.37/3.6/3A//P8100/B19/SIM PIC/2018 ILT NRC R70


Which CFCU is INOPERABLE?

A. 11

B. ✔ 12

C. 13

D. 14

*2-DR*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that CFCUs in OFF will NOT autostart.
b. Correct.
c. Incorrect. Plausible if the examinee incorrectly believes that CFCUs running in slow would have to switch to fast to perform their safeguards function.
d. Incorrect. Plausible if the examinee incorrectly believes that CFCUs running in Fast will not switch to slow to perform their safeguards function.

K/A Number:
2.2.37:
Ability to determine operability and/or availability of safety related equipment.

K/A Value: 3.6

Technical Reference(s): B19 pg 22

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-009H Obj. 3A

For Containment Fan Coil Units, describe the power supply and automatic functions including starts, trips, interlocks, and their setpoints.

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:

71. P9150L-024 043/2.2.43/3.0/1//P8100/C47.0//2018 ILT NRC R71

47006-0607, Generator Overexcitation, is a_____annunciator.

A. ✔ U1 BOP

B. U1 NSSS

C. U2 BOP

D. U2 NSSS

1-P

Understanding which alarms are U1/U2 and NSSS/BOP impacts how the procedure is used, what equipment is used, how the paperwork is filled out, and what alarms are expected. It is foundational knowledge to removing, restoring, and tracking inoperable alarms.

Justifications:
a. Correct.
b. Incorrect. Plausible if the examinee incorrectly believes that low numbered annunciators are NSS because they are more important.
c. Incorrect. Plausible if the examinee incorrectly believes that
d. Incorrect. An OOS sticker is part of the removal from service process, however this step is NA for bulb replacement. Plausible if the examinee incorrectly believes that the OOS sticker is part of a mandatory work control process for deficient components similar to the NAVY deficiency tags.

K/A Number:
2.2.43
Knowledge of the process used to track inoperable alarms.

K/A Value: 3.0

Technical Reference(s): C47.0 pg. 15

Proposed references to be provided to applicants during examination: None

Learning Objective: P9150L-024 Obj. 1

Given a plant condition and 5AWI 15.5.1., determine the responsibilities, requirements, and actions required for plant equipment control.

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:

72. P9130L-003 056/2.3.7/3.5/3.6/2//P8100/F2/RWP 180051/2018 ILT NRC R72

- An operator is performing an observation in the Auxiliary Building.
- The work requires the operator to be signed onto RWP 180051, OPERATIONS STANDARD ACTIVITES - ONLINE.
- The observation is NOT in a Contaminated Area.
- Radiation level in the area is 38 mrem/h.

- RWP 180051 Tasks 101 and 203 are provided.

1) What task will the operator sign on?
2) Is the Operator REQUIRED to contact RP prior to entry into the RCA?

A. 1) 101
   2) YES

B. 1) 101
   2) NO

C.✔ 1) 203
   2) YES

D. 1) 203
   2) NO

*3-SPR*

Justifications:
a. Incorrect. An RP briefing is required. Plausible if the examinee incorrectly believes that since a CA entry is not required, task 101 is appropriate.
b. Incorrect. Plausible if the examinee incorrectly believes that green pass requirements are met.
c. Correct.
d. Incorrect. Task 203 is correct. Plausible if examinee incorrectly believes a green pass is issued for task 202 if below the dosimeter set points.

K/A Number:
2.3.7:
Ability to comply with radiation work permit requirements during normal or abnormal conditions.

K/A Value: 3.5

Technical Reference(s): RWP 180051 task 101 and 203

Proposed references to be provided to applicants during examination: RWP 180051 101/203

Learning Objective: P9130L-003 Obj. 2

List the generic RWP requirements.

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 12
55.43 _____

Comments:

73. P8197L-012 253/2.4.12/4.0/4.3/38//P8100/SWI O-10/1ECA-2.1/2018 ILT NRC R73

- The crew is in 1ECA-2.1, Uncontrolled Depressurization of Both Steam Generators.

- Bus 15 locks out.
- 'B' Pressurizer PORV fails OPEN.

- Containment pressure is 49 psig and RISING.
- Critical Safety Function Status Tree shows a RED path for Containment Integrity.

The NEXT procedure the crew will enter is...

A. ✔ 1FR-Z.1, Response to High Containment Pressure.

B. 1E-1, Loss of Reactor or Secondary Coolant.

C. 1ECA-0.0, Loss of All Safeguards Power.

D. 1E-0, Reactor Trip or Safety Injection.

1-P

Justifications:
a. Correct.
b. Incorrect. Plausible as E-1 will be entered to address the PORV; however, in this case FR-Z.1 will be entered first and then the crew will return to ECA-2.1.
c. Incorrect. Plausible if examinee incorrectly believes ECA-0.0 must be entered for a loss of any safeguard bus; however, in this case only one bus is de-energized and ECA-0.0 will not be entered.
d. Incorrect. Plausible as E-0 would be entered for the initial trip and again for the SI due to LOCA; however, FR-Z.1 must be entered first to reduce containment pressure.

K/A Number:
E12 Uncontrolled Depressurization of all Steam Generators
2.4.12:
Knowledge of general operating crew responsibilities during emergency operations.

K/A Value: 4.0

Technical Reference(s): 1FR-Z.1, pg. 2; SWI O-10, pages 11 & 14

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-012 Obj. 38:

State the entry conditions for associated E series EOP.

Question Source: Bank # P8197L-012 253
Modified Bank # _____
New _____

Question History: Last NRC Exam 2016 ILT NRC

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

10 CFR Part 55 Content:
55.41 10
55.43 _____

Comments:

74. P8197L-011 243/2.4.8/3.8/A.2//P8100/SWI O-10/1C20.5/2018 ILT NRC R74

- The crew is performing 1E-0, Reactor Trip or Safety Injection.

- Bus 15 is LOCKED OUT.
- The cause of the lock out is UNKNOWN.
- The System Engineer is NOT AVAILABLE.
- A Reactor Operator has been directed to perform 1C20.5 AOP1, Reenergizing 4.16 KV Bus 15.

The Operator_____(1)_____REQUIRED to perform 1C20.5 AOP1 from memory.
The Operator_____(2)_____RESET the lock out.

A. (1) IS
(2) WILL

B. (1) IS
(2) WILL NOT

C. (1) IS NOT
(2) WILL

D. ✔ (1) IS NOT
(2) WILL NOT

*1-P*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that because the AOP is directed from an EOP immediate action, that the entire AOP must be performed from memory AND incorrectly believes that the lockout can be reset once similar to a tripped breaker.
b. Incorrect. The lockout can not be reset without permission from the system engineer. Plausible if the examinee incorrectly believes that because the AOP is directed from an EOP immediate action, that the entire AOP must be performed from memory.
c. Incorrect. the AOP can not be performed from memory. Plausible if the examinee incorrectly believes that the lockout can be reset once, similar to a tripped breaker.
d. Correct.

K/A Number:
2.4.8:
Knowledge of how abnormal operating procedures are used in conjunction with EOPs.

K/A Value: 3.8

Technical Reference(s): SWI O-10 page 6, 1C20.5 pg 46, 47, 49

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-011 Obj. A.2

For 1E-0, list the immediate action steps of E-0.

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:

75. P8197L-009 034/2.4.27/3.0/3.5/3//P8100/F5 APP B//2018 ILT NRC R75

- The crew is performing F5 Appendix B, Control Room Evacuation (Fire).

The Reactor Operator will place in the_____Pumps in PULL-TO-LOCK.

A. Safety Injection

B. ✔ Containment Spray

C. Auxiliary Feedwater

D. Residual Heat Removal

*1-P*

Justifications:
a. Incorrect. Plausible if the examinee incorrectly believes that SI pumps auto starting during a fire could lead to a LOCA from liquid flow through the pressurizer safety valve.
b. Correct.
c. Incorrect. Plausible if the examinee confuses AFW with MFW or incorrectly believes that CST volume must be conserved for fire fighting.
d. Incorrect. Plausible if the examinee incorrectly believes that auto start of RHR would result in a LOCA outside of containment due to high pressure in the RHR piping.

K/A Number:
2.4.8:
Knowledge of "Fire in the Plant" procedures.

K/A Value: 3.4

Technical Reference(s): F5 APP B Attachment D pg 1

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-009 Obj. 3

Describe the initial control room evacuation assignments for all crew members

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:

You have completed the test!

1. P8197L-012 257/011 EA2.09/4.3//YES/P8100/1ES-1.1//2018 ILT NRC S76

- A LOCA has occurred.
- Non-safeguard busses 11 and 12 are LOCKED OUT.
- The crew is on step 14 of 1ES-1.1, Post-LOCA Cooldown and Depressurization.

- RVLIS is 97%.
- Subcooling is 180 $^{O}$F.
- Tcold is 537 $^{O}$F.
- Both Steam Generator pressures are 925 psig.

- 1ES-1.1, Post LOCA Cooldown and Depressurization, is provided.

The Shift Supervisor will direct the crew to...

A. start a RCP.

B. raise charging flow.

C. ✔ depressurize the RCS using one PRZR PORV.

D. depressurize the RCS using normal PRZR spray.

*Justification:*

*a. Incorrect. Plausible if examinee incorrectly believes RCPs are not supplied by busses 11 & 12.*
*b. Incorrect. Plausible if examinee incorrectly believes that RVLIS level and PRZR level should be increased to support starting a RCP.*
*c. Correct. Natural circulation is occurring based on 1ES-1.1, Att. A conditions being met.*
*d. Incorrect. Plausible if examinee incorrectly believes RCPs are still running and that normal PRZR spray is still available; however, in this case RCPs are not available as Busses 11 & 12 are locked out.*

10CFR55.43(b)(5)

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.*

K/A Number:
**011 Large Break LOCA**
**EA2.09:**
Ability to determine or interpret the following as they apply to a Large Break LOCA:
Existence of adequate natural circulation.

K/A Value: 4.3

Technical Reference(s): 1ES-1.1 pg. 10 and 11; Att. A pg. 1

Proposed references to be provided to applicants during examination: 1ES-1.1

Learning Objective: P8197L-012 Obj. 17

Identify any steps that must be performed in associated E series EOP and what indications are available in the control room for verification of those steps.

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:

2. P8180L-005 016/022 2.2.42/4.6/P8180L-005 OBJ 10C/YES//T.S 3.5.4/TS 3.5.1/2018 ILT NRC S77

- Unit 1 is in Mode 1
- Chemistry has just reported the following:
  - RWST boron concentration is 1800 ppm.
  - SI Accumulator boron concentration is 2400 ppm.

- TS LCO 3.5.1, Accumulators, is provided.
- TS LCO 3.5.4, Refueling Water Storage Tank, is provided.

The Shift Supervisor will enter T.S. (1) and restore boron concentration within (2) hours.

A. (1) 3.5.1
(2) 72

B. (1) 3.5.1
(2) 8

C. (1) 3.5.4
(2) 72

D. ✔ (1) 3.5.4
(2) 8

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(2) Tech Specs. The question can NOT be answered by solely knowing < 1 hour TS actions OR by solely knowing the LCO "above the line" information OR by solely knowing TS Safety Limits. The question requires the application of required actions for [enter T.S., TRM, or ODCM]. K/A is Loss of Rx Coolant Make up, If you are not within the T.S. range for Boron, RWST is not operable therefore make up source is lost.*

*Justifications:*
*a. Incorrect. Plausible if examinee incorrectly believes SI Accumulator Boron concentration is not in band.*
*b. Incorrect. Plausible if examinee incorrectly believes SI Accumulator Boron concentration is not in band and that completion time is 8 hours.*
*c. Incorrect. Plausible if examinee incorrectly believes actions statement is 72 hours to restore RWST boron concentration.*
*d. Correct.*

K/A Number:
**022 Loss of Rx Coolant Makeup**
**2.2.42:**
Ability to recognize system parameters that are entry-level conditions for technical specifications

K/A Value: 4.6

Technical Reference(s): T.S. 3.5.1 and 3.5.4

Proposed references to be provided to applicants during examination: T.S. 3.5.1 and 3.5.4

Learning Objective: P8180L-005 Obj 10c

Apply technical specifications for given plant conditions to determine required actions.

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

10CFR Part 55 Content:
55.41
55.43 2

3. P8180L-003 075/025 AA2.03/3.8/7B/YES/P8100/1C1.6 AOP2//2018 ILT NRC S78

- Unit 1 is in Mode 5.
- Train 'A' of RHR is in shutdown COOLING.
- CV-31237, 11/12 RHR HX BYPASS FLOW, is modulating OPEN.
- Natural Circulation can NOT be established.
- Containment sump level is RISING.
- Pressurizer Level is LOWERING.

- The crew is performing 1C1.6 AOP2, Shutdown Loss of Inventory.

The Shift Supervisor will transition to...

A. 1ES-1.3, Recirculation Sump Blockage.

B. 1ECA-1.2, LOCA Outside Containment.

C. ✔ 1E-4, Core Cooling Following Loss of RHR Flow.

D. 1ECA-1.1, Loss of Emergency Coolant Recirculation

*3-SPK*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes that a train of RHR is already in recirculation mode and increasing sump level indicates blockage.*
*b. Incorrect. Plausible if the examinee incorrectly believes that because a leak has occurred while RHR is in service that the leak is outside of containment.*
*c. Correct. 1C1.6 AOP1 directs entry into 1E-4 if inventory can not be maintained by available charging pumps in step 7.*
*d. Incorrect. Plausible if the examinee incorrectly believes that the RHR will eventually cavitate from loss of inventory.*

K/A Number:
**025 Loss of Residual Heat Removal System (RHRS)**
**AA2.03:**
Ability to determine and interpret the following as they apply to the Loss of RHR system:
Increasing reactor sump level.

K/A Value: 3.8

Technical Reference(s): 1C1.6 AOP2 pg 5

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-003 Obj. 7b

For the RHR system, Predict the system response to a component failure.

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:

4. P8172L-002 134/026 2.2.40/4.7/10C/YES/P8100/TS 3.7.7//2018 ILT NRC S79

- Unit 2 is at 100% power.
- 21 CC pump trips due to overcurrent lockout at 0800 on 8/24/2018.
- 21 CC pump will be returned to service in 3 weeks.

- Below is an excerpt from TS LCO 3.7.7., Component Cooling Water (CC) System.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One CC train inoperable. | A.1 ----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CC. ---------- Restore CC train to OPERABLE status. | 72 hours |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 Be in MODE 3. AND B.2 Be in MODE 5. | 6 hours 36 hours |

Per Technical Specifications, when is the latest Unit 2 can be in Mode 5?

A. 0800 on 8/27/2018.

B. 1400 on 8/27/2018.

C. ✔2000 on 8/28/2018.

D. 0200 on 8/29/2018.

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(2) Tech Specs. The question can NOT be answered by solely knowing < 1 hour TS actions OR by solely knowing the LCO "above the line" information OR by solely knowing TS Safety Limits. The question requires the application of required actions for T.S. LCO 3.7.7.*

*Justifications:*
*a. Incorrect. Plausible if examinee incorrectly believes that unit must be in mode 5 immediately if actions of condition A are not met in the completion time.*
*b. Incorrect. Plausible if examinee incorrectly believes that the unit must be in mode 5 Six hours after failure to complete the actions of condition A.*
*c. Correct.*
*d. Incorrect. Plausible if examinee incorrectly believes that the required time to be in Mode 5 is 36 hours from the time to be in Mode 3 rather than 36 hours from the expiration of the completion time for condition A.*

K/A Number:
**026 Loss of Component Cooling Water**
**2.2.40:**
Knowledge of limiting conditions for operations and safety limits.

K/A Value: 4.7

Technical Reference(s): T.S. LCO 3.7.7

Proposed references to be provided to applicants during examination: None

Learning Objective: P8172L-002 Obj. 10C.

Apply technical specifications to given plant conditions to determine required actions.

Question Source: Bank # P8172L-002 134
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 2

Comments:

5. P8186L-015 029/057 AA2.08/3.5*/7A/YES/P8100/C47505-0607//2018 ILT NRCS80

- Unit 2 is in MODE 1.
- 120 VAC Panel 217 is DE-ENERGIZED.
- Annunciator 47505-0607, EVENT MNTR INSTR BUS 2EMB UNDERVOLTAGE, is ALARMING.

What is the status of Neutron Flux Monitors 2N51 and 2N52?

| | 2N51 | 2N52 |
|---|---|---|
| A. | OPERABLE | OPERABLE |
| B. ✔ | OPERABLE | NOT OPERABLE |
| C. | NOT OPERABLE | OPERABLE |
| D. | NOT OPERABLE | NOT OPERABLE |

*3-SPK*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(1) Conditions and limitations in the facility license. This question requires administration of operability determination program requirements such as compensatory actions associated with inoperable safeguards systems, RG 1.97, etc.*

*Justifications:*
*a. Incorrect. Plausible if examinee incorrectly believes 2N51 & 2N52 still have inverter power available.*
*b. Correct. 2N51/2N52 are normally powered by AC instrument inverters 27/28. If the inverters are bypassed, N51/N52 would still have unregulated power available and be operable. They can also be manually shifted to alternate power sources U1 Panel 117 for 2EMA and U2 217 for 2EMB. With the UV alarm in and no alternate source available, 2N52 would be inoperable.*
*c. Incorrect. Plausible if examinee incorrectly believes the odd numbered Panel 217 is a source for 2N51, similar to Unit 1 where Panel 117 is the alternate for 1EMA and N51.*
*d. Incorrect. Plausible if examinee incorrectly believes both NFMs are powered from same EM panel.*

K/A Number:
**057 Loss of Vital AC Electrical Instrument Bus**
**AA2.08:**
Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus:
Reactor power digital display and remote flux meter.

K/A Value: 3.5*

Technical Reference(s): C47505-0607, pg 1; T.S. 3.3.3

Proposed references to be provided to applicants during examination: None

Learning Objective: P8186L-015 Obj. 7A

Predict the response of the system to a loss of power.

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 1

Comments:

6. P8140L-233 007/E04 2.4.3/3.9/B.7/YES/P8100/1E-1//2018 ILT NRC S81

- The crew is performing 1E-1, Loss of Reactor or Secondary Coolant.

- 11 RHR pump is RUNNING.
- 12 RHR pump is LOCKED OUT.
- RCS pressure is 1827 psig and STABLE.
- RHR flow is 0 gpm.
- RWST level is 91% and SLOWLY LOWERING.
- Containment pressure is 0 psig and STABLE.
- R-26, U1 RHR 11/21 Cubicle Air Radiation, is ALARMING.
- 47016-0602, 11 RHR PIT SUMP HI/LO LVL, is ALARMING.

- 1E-1 (excerpt) is provided.

The Shift Supervisor will direct the crew to enter...

A. 1ES-1.2, Transfer to Recirculation. B. ✔

1ECA-1.2, LOCA Outside Containment.

C. 1ECA-1.1, Loss of Emergency Coolant Recirculation.

D. 1ES-1.1, Post LOCA Cooldown and Depressurization.

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.*

*Justification:*
*a. Incorrect. Plausible if the examinee incorrectly believes the RWST level requires switchover to recirc.*
*b. Correct.*
*c. Incorrect. Plausible if the examinee incorrectly believes that RHR flow indicates a loss of recirc capability.*
*d. Incorrect. Plausible if the examinee incorrectly believes that auxiliary building radiation levels are normal during accident conditions.*

K/A Number:
**Westinghouse E04 LOCA Outside Containment**
**2.4.3:**
Ability to identify post-accident instrumentation.

K/A Value: 3.9

Technical Reference(s): 1E-1 pages 9-12

Proposed references to be provided to applicants during examination: 1E-1 pages 9-12

Learning Objective: P8140L-233 Obj. B7

For 1E-1, explain the purpose for any step or step sequence for the associated E or FR series EOP.

Question Source: Bank # _
Modified Bank # P8140L-233 005
New X

Question History: Last NRC Exam 2017 LOR Biannual Exam (No ILT history)

Question Cognitive Level:
Memory or Fundamental Knowledge _
Comprehension or Analysis _ X

10 CFR Part 55 Content:
55.41 _
55.43 5

Comments:

7. P7410L-034 027/033 AA2.07/4.2/9/YES/P8100/F3-2.1/PINGP 577/2018 ILT NRC S82

Per F3-2.1, Emergency Action Level Technical Bases, if power is NOT less than 5% in step 1 of 1E-0, Reactor Trip and Safety Injection, which Fission Product Barrier(s) will be challenged?

| | CONTAINMENT | FUEL CLADDING | REACTOR COOLANT SYSTEM |
|---|---|---|---|
| A. | CHALLENGED | NOT CHALLENGED | CHALLENGED |
| B.✔ | NOT CHALLENGED | CHALLENGED | NOT CHALLENGED |
| C. | CHALLENGED | CHALLENGED | NOT CHALLENGED |
| D. | NOT CHALLENGED | NOT CHALLENGED | CHALLENGED |

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(1) Conditions and limitations in the facility license. This question requires knowledge of facility limitations intended to ensure safe plant shutdown.*

*In the event that a loss of IR were to occur, the RO may not be able to verify definitively that flux is decreasing. The RO would then move to the RNO of step 1 of 1E-0 and verify that reactor power is less than 5%.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes that power level above 5% would cause the RCS to overpressure and vaporize all liquid from the RCS and RWST which would result in a rapid increase in containment pressure and loss of the RCS.*
*b. Correct.*
*c. Incorrect. Fuel Cladding is challenged. Plausible if the examinee incorrectly believes that power level above 5% would cause higher energy steam to be released during a loca which would challenge the containment barrier.*
*d. Incorrect. Plausible if the examinee incorrectly believes that power level above 5% would cause overpressure in low pressure RHR piping, creating a LOCA.*

K/A Number:
**033 Loss of Intermediate Range Nuclear Instrumentation**
**AA2.07:**
Ability to determine and interpret the following as they apply to the loss of Intermediate Range Nuclear Instrumentation:
Confirmation of reactor trip.

K/A Value: 4.2

Technical Reference(s): F3-2.1 Pg 6-S-14

Proposed references to be provided to applicants during examination: None

Learning Objective: P7410L-034 Obj. 9

Given the expected exposure levels for an emergency classification, be able to correctly identify that classification.

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 1

Comments:

8. P8182L-004 028/2.4.41/4.6/12/YES/P8100/F3-2/PINGP 1576/2018 ILT NRC S83

- Fuel handling is in progress.
- R-25, SFP SPENT FUEL POOL AIR RADIATION, is reading 2 R/hr.
- Spent Fuel Pool Special ventilation failed to actuate.

- PINGP 1576 is provided.

The highest classification that is met is a(n) .

A. Unusual Event

B. ✔ Alert

C. Site Area Emergency

D. General Emergency

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(6) Procedures and limitations involved in alterations in core configuration. This question requires evaluating emergency classifications based on core conditions.*

*Justifications:*

*a. Incorrect, Plausible if examinee incorrectly believes that Unusual Event is a higher classification than alert.*
*b. Correct.*
*c. Incorrect. Plausible if the examinee incorrectly believes that RS1.1 is met due to a value on table R-1 being exceeded.*
*d. Incorrect. Plausible if examinee incorrectly believes SFP area is required for infrequent access to maintain plant safety functions.*

K/A Number:
**036 Fuel Handling Incidents**
**2.4.41**
Knowledge of the emergency action level thresholds and classifications.

K/A Value: 4.6

Technical Reference(s): F3-2, PINGP 1576

Proposed references to be provided to applicants during examination: PINGP 1576

Learning Objective: P8182L-004 Learning Objective 12

For a given fuel handling accident, use F3-2 to classify the event

Question Source Bank# _
Modified Bank # _
New x

Question History: Last NRC Exam N/A

Question Cognitive Level:
Memory or Fundamental Knowledge N/A
Comprehension or Analysis: Yes

10CFR Part 55 Content: _ 6

Comments:

9. P8140L-229 005/067 AA2.05/3.6/A.5/YES/P8100/F5 APP A//2018 ILT NRC S84

- A FIRE is occurring in the Train B Event Monitoring Room.
- F5 Appendix A, Fire Strategies, (excerpt) is provided.

Per F5 Appendix A, The Shift Supervisor will direct the crew to secure...

A. Control Room Ventilation.

B. Turbine Building Roof Exhausters.

C. ✔ Train B Event Monitor Cooling Fans.

D. Auxiliary Building Normal Ventilation.

*3-SPK*

*EXPLANATION:*
*This question is linked to 10CFR 55.43(b)(1), Conditions and limitations in the facility license. This question requires administration of fire protections program requirements such as compensatory actions associated with inoperable sprinkler systems, fire doors, etc.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes the purpose of securing ventilation is to ensure habitability is maintained in the control room.*
*b. Incorrect. Plausible if the examinee incorrectly believes the purpose of securing ventilation is to ensure that combustion products are not released unmonitored to the atmosphere until radiological surveys are complete.*
*c. Correct.*
*d. Incorrect. Plausible if the examinee incorrectly believes the purpose of securing ventilation is to ensure the fire does not spread to other areas of the plan via the negative pressure in the aux building.*

K/A Number:
**067 Plant fire on site**
**AA2.05**
**Ability to determine and interpret the following as they apply to the Plant Fire on Site: Ventilation alignment necessary to secure affected area.**

K/A Value: 3.6

Technical Reference(s): F5 Appendix A Zone 50

Proposed references to be provided to applicants during examination: F5 Appendix A Zone 50

Learning Objective: P8140L-229 A5
For Procedure: F5
Explain the Purpose and Sequence of Major Steps

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 1

Comments:

10. P8197L-012 255/W/E 03 2.4.18/4.0/15/YES/P8100/1ES-1.1//2018 ILT NRC S85

- A SBLOCA has occurred.
- The crew is performing 1E-1, Loss of Reactor or Secondary Coolant.

- RCS pressure is 1700 psig and STABLE.
- RHR Flow is 0 gpm.
- RWST level is 90% and SLOWLY LOWERING.

The Shift Supervisor will transition to (1)
and direct the crew to STOP one Safety Injection pump to
(2) .

A. (1) 1ES-1.2, Transfer to Recirculation
(2) minimize break flow

B. (1) 1ES-1.2, Transfer to Recirculation
(2) ensure RCS conditions are within acceptable limits

C. ✔ (1) 1ES-1.1, Post LOCA Cooldown and Depressurization
(2) minimize break flow

D. (1) 1ES-1.1, Post LOCA Cooldown and Depressurization
(2) ensure RCS conditions are within acceptable limits

*3-SPK*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.*

*Justifications:*
*a. Incorrect. Stopping the SI Pump will minimize break flow. Plausible if the examinee incorrectly believes that the crew will loop through 1E-1 until the conditions for entry into 1ES-1.2 are met and incorrectly believes the basis for transfer to recirc is to lower pressure enough that RHR can inject into the RCS and allow recirc flow. The crew may eventually transfer to 1ES-1.2 from 1ES-1.1, however once transferred to transfer to recirc, break flow will equal RHR flow so minimizing break flow is no longer a goal.*
*b. Incorrect. Plausible if the examinee incorrectly believes that the crew will loop through 1E-1 until the conditions for transfer to recirc are met and incorrectly believes that when the SI pumps are not stopped until the plant is in mode 5 and that RCS conditions are acceptable for that mode (similar to SI termination).*
*c. Correct. Due to pressure above RHR shut off head, the crew transitions to 1ES-1.1 and begins cooldown and depressurization. One or both SI pumps are stopped to minimize break flow while the plant cools down to mode 5.*
*d. Incorrect. The crew will transition to 1ES-1.1. Plausible if the examinee incorrectly believes that SI pumps are not shut off until the plant reaches mode 5 and that RCS pressure and temperature conditions are considered acceptable (similar to SI termination) and SI flow is not required.*

K/A Number:
**W/E03 LOCA Cooldown and Depressurization**
**2.4.18:**
Knowledge of the specific basis for EOPs.

K/A Value: 4.0

Technical Reference(s): 1ES-1.1 Basis Pg. 6

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-012 Obj 15

Explain the purpose of any step or step sequence for the associated E series EOP

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:

11. P8197L-012 262/005 A2.01/2.9*/15/YES/P8100/1ES-1.2//2018 ILT NRC S86

- A Large Break LOCA has occurred.
- The crew has just entered 1ES-1.2, Transfer to Recirculation.
- BOTH 11 and 12 RHR Pumps are LOCKED OUT.
- 1ES-1.2 is provided.

The Crew will transition to...

A. 1ES-0.3, Natural Circulation Cooldown

B. 1FR-I.2, Response to Low System Inventory.

C. ✔ 1ECA-1.1, Loss of Emergency Coolant Recirculation.

D. 1ES-1.1, Post LOCA Cooldown and Depressurization.

*3-SPK*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires the knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific sub-procedures or emergency contingency procedures.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes this is the appropriate procedure based on there being no source of forced convection available with NO RHR pumps and that it was the procedure and step in effect.*
*b. Incorrect. A yellow path would exist on Inventory. Plausible if the examinee incorrectly believes that the current procedure should be exited to address a yellow path.*
*c. Correct.*
*d. Incorrect. A Loca has occurred and additional cooing is desired. Plausible if the examinee incorrectly believes that this procedure applies during a LB Loca and that it was the procedure and step in effect.*

K/A Number:
**005 Residual Heat Removal**
**A2.01:**
Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Failure modes for pressure, flow, pump motor amps, motor temperature, and tank level instrumentation

K/A Value: 2.9*

Technical Reference(s): 1ES-1.2 pg 3 and B15 pg9

Proposed references to be provided to applicants during examination: 1ES-1.2

Learning Objective: P8197L-012 Obj. 15

For 1ES-1.2, explain the purpose for any step or step sequence for associated E Series EOP.

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:

12. P7410L-034 026/013 2.2.44/4.4/10/YES/P8100/F3-2.1/PINGP 577/2018 ILT NRC S87

- Unit 1 is in Mode 1.

- A large break LOCA has occurred in containment.
- Safety Injection automatically actuated.
- Containment Isolation did NOT automatically actuate.

- The Reactor Operator manually actuates Containment Isolation.

- 1 minute later, indications are as shown:


- PINGP 577, Emergency Notification Report Form, is provided.
- F3-2.1, Emergency Action Level Technical Bases (excerpt) is provided.

QUESTION CONTINUED ON NEXT PAGE

12. P7410L-034 026/013 2.2.44/4.4/10/YES/P8100/F3-2.1/PINGP 577/2018 ILT NRC S87

QUESTION CONTINUED FROM PREVIOUS PAGE

What is the status of the Containment Barrier for the INITIAL classification?
What Release Status will the Shift Manager select in Box 6 of PINGP 577?

| | CONTAINMENT BARRIER | RELEASE STATUS |
|---|---|---|
| A. | LOST | NONE |
| B.✔ | LOST | TERMINATED |
| C. | NOT LOST | NONE |
| D. | NOT LOST | TERMINATED |

*3-SPR*

*SRO EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(6) Procedures and limitations involved in alterations in core configuration. This question requires evaluating emergency classifications based on core conditions.*

*Justifications:*
*a. Incorrect. Containment barrier is lost. Plausible if the examinee incorrectly believes that no release occurred because a loss of coolant refers to the secondary system that cools the RCS.*
*b. Correct.*
*c. Incorrect. Plausible if the examinee incorrectly believes that containment is not lost because of the manual actuation of CI and that no release occurred because a loca is a loss of the secondary system.*
*d. Incorrect. The release is terminated. Plausible if the examinee incorrectly believes that containment is not lost because the reactor operator has hit the containment isolation.*

K/A Number:

**013 Engineered Safety Features Actuation System (ESFAS)**

**2.2.44:**

Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

K/A Value: 4.4

Technical Reference(s): PINGP 577 Figure 2, F3-2.1 page 6-F-15

Proposed references to be provided to applicants during examination: PINGP 577; F3-2.1 pages 6-F-1 through 6-F-17

Learning Objective: P7410L-034 Obj. 10

Using F3-2, correctly classify emergency conditions within 15 minutes of being given a set of emergency action levels.

Question Source: Bank # _
Modified Bank # _
New X

Question History: Last NRC Exam N/A

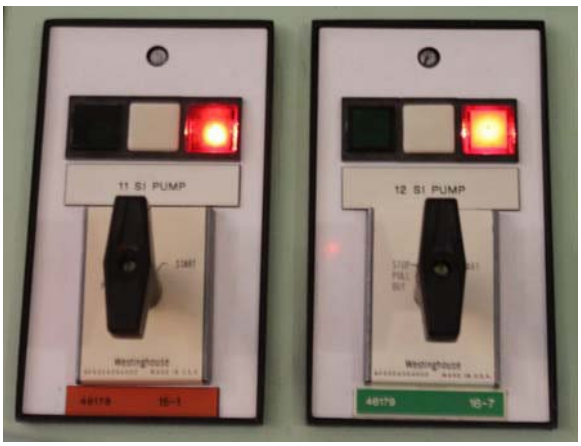
Question Cognitive Level:
Memory or Fundamental Knowledge _
Comprehension or Analysis _ X

10 CFR Part 55 Content:
55.41 _
55.43 6

Comments:

13. P8180L-002 051/026 A2.08/3.7/9/YES/P8100/1ES-1.2/1ECA-1.1/2018 ILT NRC S88

- A large break LOCA has occurred.
- BOTH Containment Spray Pumps are RUNNING.
- Containment pressure 31 psig.
- RWST level is 32%.
- 47016-0102, 11 RHR PUMP LOCKED OUT, is ALARMING.
- The crew has entered 1ES-1.2, Transfer to Recirculation.


- 1ES-1.2 is provided.

Based on CURRENT conditions, which Containment Spray Pump(s) will the Shift Supervisor direct the crew to STOP?

A. 11

B. ✔ 12

C. BOTH 11 and 12

D. NEITHER 11 nor 12

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes that since 11 RHR pump is OOS 11 CS pump should be stopped to keep all B train ECCS equipment Operable.*
*b. Correct.*
*c. Incorrect. Plausible if the examinee incorrectly believes that because containment pressure is below the design basis pressure or because of RWST level, both pumps will be stopped during 1ES-1.2.*
*d. Incorrect. Plausible if the examinee incorrectly believes that because containment pressure is too high, neither pump should be stopped.*

K/A Number:
**026 Containment Spray System (CSS)**
**A2.08**
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:
Safe securing of containment spray when it can be done

K/A Value: 3.7

Technical Reference(s): 1ES-1.2 pg 3

Proposed references to be provided to applicants during examination: 1ES-1.2

Learning Objective: P8180L-002 Obj. 9

Explain the importance of the system to plant safety (as appropriate): Accident analysis involving the system.

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:

14. P8197L-014 215/061 A2.05/3.4*/25/YES/P8100/1FR-H.1/1FR-S.1/2018 ILT NRC S89

- All Feedwater Regulating Valves failed CLOSED.
- The reactor can NOT be tripped from the control room.
- 11 and 12 Auxiliary Feedwater Pumps could NOT be started.

- The crew has entered 1FR-H.1, Response to Loss of Secondary Heat Sink.

- RCS pressure is 2176 psig.
- RCS hot leg temperature is 550°F
- 11 Steam Generator level is 31% WIDE range.
- 12 Steam Generator level is 25% WIDE range.

- 1FR-H.1 (excerpt) is provided.

The Shift Supervisor will...

A. establish RCS bleed and feed.

B. return to the procedure and step in effect.

C. place RHR in service per 1C15, Residual Heat Remvoal System - Unit 1.

D. ✔ Restore AFW flow from Unit 2 per 1C28.1, Auxiliary Feedwater System - Unit 1.

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes narrow range SG levels are used to determine if bleed and feed is established unless indication is given that containment is adverse similar to info page actions of 1E-0.*
*b. Incorrect. Plausible if the examinee incorrectly believes that normal steam generator is 2235. This would cause the operator to move to the RNO on step 1a and return to procedure.*
*c. Incorrect. Plausible if the examinee incorrectly believes that RHR should be put in service to reduce temperature to less than 350 degrees.*
*d. Correct.*

K/A Number:
**061 Auxiliary/Emergency Feedwater (AFW) System**
**A2.05:**
Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Automatic control malfunction.

K/A Value: 3.4*

Technical Reference(s): 1FR-H.1 pg 3 and 4

Proposed references to be provided to applicants during examination: 1FR-H.1 pages 3-10

Learning Objective: P8197L-014 Obj. 25

For procedures FR-H.1, FR-H.2, FR-H.3, FR-H.4, and FR-H.5, explain the purpose for any step or step sequence for associated E or FR Series EOP.

Question Source: Bank # -
Modified Bank # -
New X

Question History: Last NRC Exam N/A

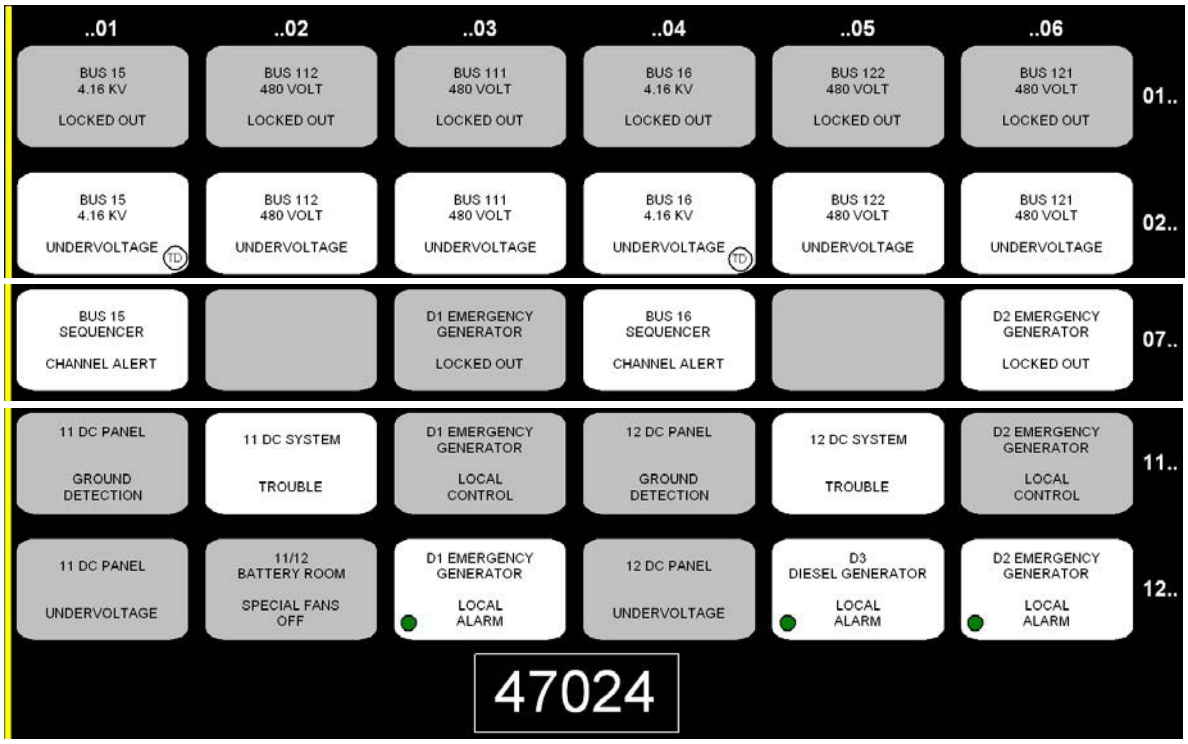
Question Cognitive Level:
Memory or Fundamental Knowledge -
Comprehension or Analysis - X

10 CFR Part 55 Content:
55.41 -
55.43 5

Comments:

15. P8197L-011 242/064 2.4.20/4.3/F/YES/P8100/1ECA-0.0//2018 ILT NRCS90

- A LOOP has occurred.
- Safety Injection is NOT actuated.
- Unit 2 Safety Injection pumps are OFF.
- Bus 25 and 26 are ENERGIZED.
- The crew is performing Step 6 of 1ECA-0.0, Loss of All Safeguards AC Power.




- 1ECA-0.0 (excerpt) is provided.

The Shift Supervisor will direct the crew to energize BUS (1) from the (2) .

A. (1) 15
(2) Bus 15/25 Bus Tie

B. ✔ (1) 15
(2) D1 Emergency Diesel Generator

C. (1) 16
(2) Bus 16/26 Bus Tie

D. (1) 16
(2) D2 Emergency Diesel Generator

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes that because of the local alarms, both diesels are inoperable and incorrectly believes that Bus 16 is not available because of the D2 lockout.*
*b. Correct.*
*c. Incorrect. Plausible if the examinee incorrectly believes that both diesels are unavailable because of the local alarms and that bus 15 is preferred bus to energize from the bus tie.*
*d. Incorrect. Plausible if the examinee incorrectly believes that both diesels are available because the LOOP bypassed the lockouts and the diesels will start manually.*

K/A Number:
**064 Emergency Diesel Generators (ED/G)**
**2.4.20:**
Knowledge of the operational implications of EOP warnings, cautions, and notes.

K/A Value: 3.9

Technical Reference(s): 1ECA-0.0 page 6 and 7

Proposed references to be provided to applicants during examination: 1ECA-0.0 page 6 and 7

Learning Objective: P8197L-011 Obj. F

Given a procedural step or series of steps, state the purpose/basis for the step:
ECA-0.0, ECA-0.1, & ECA-0.2, Loss of All AC Power Procedures

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:

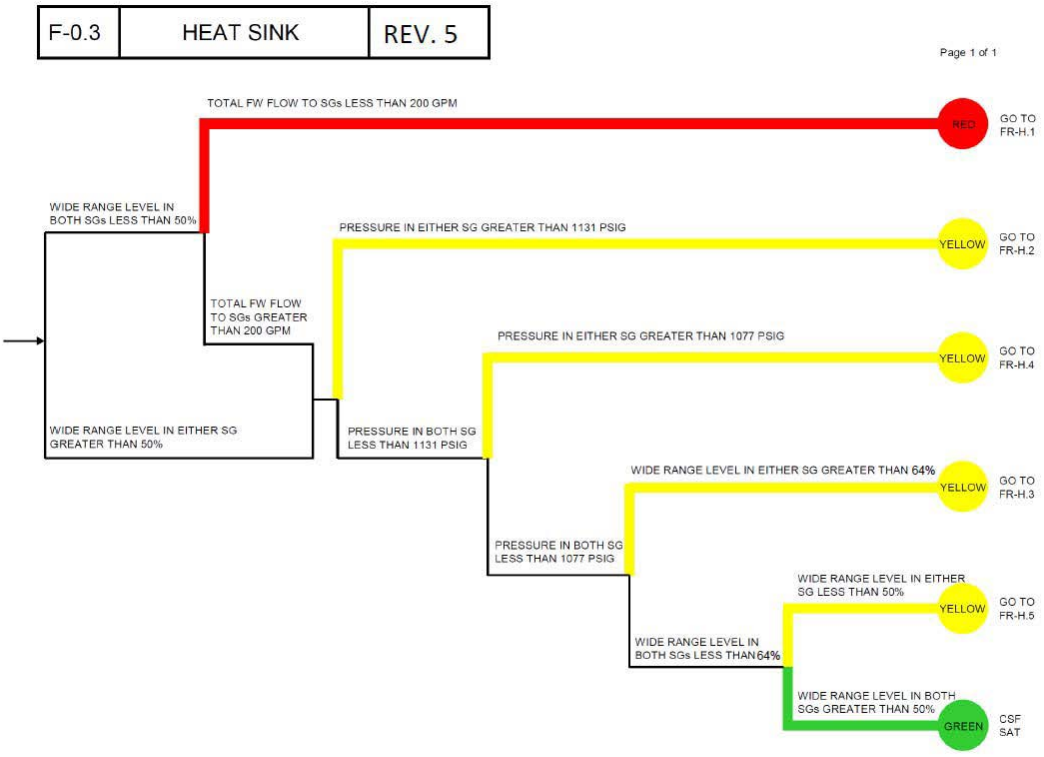
16. P8197L-014 214/002 A2.04/4.6/21/YES/P8100/F-0.3//2018 ILT NRC S91

- The crew is performing 1E-1, Loss of Reactor of Secondary Coolant.
- Reactor power is 1% and LOWERING.

- 11 Steam Generator LEVEL is 41% WIDE RANGE.
- 12 Steam Generator LEVEL is 39% WIDE RANGE.

- Total Feed Flow to 11 and 12 Steam Generators is 0 gpm.

- 11 Steam Generator Pressure is 950 psig.
- 12 Steam Generator Pressure is 935 psig.




To address the Heat Sink Critical Safety Function, the Shift Supervisor will transition to...

A. ✔ 1FR-H.1, Response to Loss of Secondary Heat Sink.

B. 1FR-H.2, Response to Steam Generator Overpressure.

C. 1FR-H.3, Response to Steam Generator High Level.

D. 1FR-H.5, Response to Steam Generator Low Level.

*3-SPK*

*EXPLANATION: This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires the knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific sub-procedures or emergency contingency procedures.*
*This question is NOT RO because the answer and distractors all meet entry conditions. The SRO must decide which is the highest priority procedure with which to proceed.*

*Justifications:*
*a. Correct.*
*b. Incorrect. Plausible if the examinee incorrectly believes that steam generator pressure is too high and must be addressed.*
*c. Incorrect. Plausible if the examinee incorrectly believes that steam generator level should be at the zero power program level (33%, but on narrow range) and believes this must be addressed.*
*d. Incorrect. Steam Generator Level is low. Plausible if the examinee incorrectly believes that the result of the status tree evaluation is a yellow path vs. a red path due to a combination of steam generator levels and flow.*

K/A Number:
**002 Reactor Coolant System (RCS)**
**A2.04:**
Ability to (a) predict the impact of the following malfunctions or operations on the RCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Loss of Heat Sink.

K/A Value: 4.6

Technical Reference(s): F-0.3 page 1

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-014 Obj 21.

For procedures FR-H.1, FR-H.2, FR-H.3, FR-H.4, and FR-H.5, state the entry conditions for associated E or FR series EOP.

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:

17. P8140L-246 029/045 2.2.22/4.7/4/YES/P8100/C20.3 AOP1/TS LCO 3.8.1/2018 ILT NRC S92

- Unit 2 is in MODE 1.
- The substation is in a normal alignment.
- Security Analysis is OUT OF SERVICE.
- All 345 KV Lines are IN SERVICE.

- 2R Transformer operating conditions are being evaluated.

- D3, Diesel Generator, is OUT OF SERVICE.

- Completed Figure 5 from C20.3 AOP1, Evaluating System Operating Conditions When Security Analysis is Out of Service, is provided.
- TS LCO 3.8.1, AC Sources - Operating, is provided.

The Shift Supervisor will enter T.S. LCO 3.8.1 Condition .

A. ✔ A

B. B

C. C

D. D

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(2) Tech Specs. The question can NOT be answered by solely knowing < 1 hour TS actions OR by solely knowing the LCO "above the line" information OR by solely knowing TS Safety Limits. The question requires the application of required actions for T.S.*

*Justifications:*
*a. Correct.*
*b. Incorrect. Plausible if the examinee incorrectly believes that the bases for 3.8.1 include all DG not just the safeguards DG and that no paths are inoperable based on the Figure 5.*
*c. Incorrect. Plausible if the examinee incorrectly believes that all 345 kV sources are declared inoperable if the operating point is on the wrong side of the line.*
*d. Incorrect. One path is inoperable. Plausible if the examinee incorrectly believes that the bases for 3.8.1 includes all DG and not just the safeguards DG.*

K/A Number:
**045 Main Turbine Generator (MT/G) System**
**2.2.22:**
Knowledge of limiting conditions for operation and safety limits.

K/A Value: 4.7

Technical Reference(s): TS LCO 3.8.1, C20.3 AOP1 pg. 6

Proposed references to be provided to applicants during examination: C20.3 AOP1 Figure 5 and TS LCO 3.8.1

Learning Objective: P8140L-246 Obj. 4

For C20.3 AOP1, Explain any limitations.

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 2

Comments:

18. P8182L-001A 011/068 A2.04/3.3/11/YES/P8100/H4 ODCM TBL 2.2//2018 ILT NRC S93

- Unit 1 Steam Generators are blowing down to the river for chemistry control.
- 123 ADT Monitor Tank is being released to the river.

- 1R-19, SG BLOWDOWN MONITOR, is INOPERABLE.
- R-18, LIQUID RELEASE MONITOR, is INOPERABLE.

- Grab samples from Unit 1 Steam Generator Blowdown Effluent Line are being taken and analyzed every 10 hours.
- Two independent samples of the 123 ADT Monitor Tank were analyzed.
- All sample results are satisfactory.
- A verification of the release rate calculation and discharge line valve lineup has NOT been performed for either of the releases.

- Table 2.2 of H4, Offsite Dose Calculation Manual, is provided.

Using H4, determine if each of the releases must be suspended or may continue.

| | Unit 1 SG Blowdown | 123 ADT Monitor Tank |
|---|---|---|
| A. | MAY CONTINUE | MAY CONTINUE |
| B.✔ | MAY CONTINUE | MUST BE SUSPENDED |
| C. | MUST BE SUSPENDED | MAY CONTINUE |
| D. | MUST BE SUSPENDED | MUST BE SUSPENDED |

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(2) Tech Specs. The question can NOT be answered by solely knowing < 1 hour TS actions OR by solely knowing the LCO "above the line" information OR by solely knowing TS Safety Limits. The question requires the application of required actions for [enter T.S., TRM, or ODCM].*

*Justifications:*
*a. Incorrect. Plausible as the Unit 1 SG Blowdown release may continue; however, the release of 123 ADT Monitor Tank must be suspended. Examinee may incorrectly believe the release of 123 ADT Monitor Tank may continue because two independent samples of the tank were taken and analyzed; however, a verification of the release rate calculation and discharge line valve lineup must also be performed.*
*b. Correct.*
*c. Incorrect. Plausible if the examinee incorrectly believes two independent samples of both sources of the releases must be performed and analyzed and that is the only requirement regardless of the source.*
*d. Incorrect. Plausible as the release from 123 ADT Monitor Tank must be suspended; however, the release of the Unit 1 SG Blowdown may continue. Examinee may incorrectly believe the release of Unit 1 SG blowdown must be suspended if they apply action 1 criteria instead of action 2 criteria.*

K/A Number:
**068 Liquid Radwaste System (LRS)**
**A2.04:**
Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Failure of automatic isolation.

K/A Value: 3.3

Technical Reference(s): H4, Table 2.2

Proposed references to be provided to applicants during examination: H4, Table 2.2

Learning Objective: P8182L-001A Obj. 11

Use of the ODCM.

Question Source: Bank #: P8182L-001A 011
Modified Bank #: N/A
New: N/A

Question History: Last NRC Exam: 2007 NRC; 2012 AUDIT; 2016 NRC

Question Cognitive Level:
Memory or Fundamental Knowledge:
Comprehension or Analysis: X

10 CFR Part 55 Content:
55.41(b):
55.43(b): 2

Comments:

19. P8140L-231 004/2.1.23/4.4/A.5/YES/P8100/C35 AOP6//2018 ILT NRC S94

- A MAJOR cooling water leak is occurring.
- The leak is on the outlet of 122 Control Room Chiller.
- The crew has entered C35 AOP6, Loss of Cooling Water Return Header.

- C35 AOP6 is provided.

The Shift Supervisor will direct step of C35 AOP6.

A. 2.5.5.

B. ✔ 2.5.6.

C. 2.5.7.

D. 2.5.8.

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires assessing plant conditions (normal, abnormal, or emergency) and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes that the 121 CR Chiller is on the A header.*
*b. Correct.*
*c. Incorrect. Plausible if the examinee incorrectly believes that the 121 CR Chiller is in the Turbine building.*
*d. Incorrect. Plausible if the examinee incorrectly believes that the 121 CR Chiller is on the A header and in the turbine building.*

K/A Number:
**2.1.23:**
Ability to perform specific system and integrated plant procedures during all modes of plant operations.

K/A Value: 3.9

Technical Reference(s): C35 AOP6 pg 4

Proposed references to be provided to applicants during examination: C35 AOP6

Learning Objective: P8140L-231 Obj. A.5

For C35 AOP6, Explain the purpose and sequence of major steps

Question Source: Bank # _
Modified Bank # P8140L-231 003 and 006
New _

Question History: Last NRC Exam 2017 Biannual Requalification

Question Cognitive Level:
Memory or Fundamental Knowledge _
Comprehension or Analysis _ X

10 CFR Part 55 Content:
55.41 _
55.43 5

Comments:

20. P7410L-035 005/2.1.14/3.1/2A/YES/P8100/PINGP 1125//2018 ILT NRC S95

- Both Units are at 100% power.
- It is 1300 hours on a Wednesday.
- NO severe weather is occurring.

- An immediate evacuation of the New Admin Building is required.
- NO classification is required.

- PINGP 1125 Attachment A, Immediate Local Evacuation Prior to Classification, is provided.

Via plant page, the Shift Supervisor will direct personnel to assemble at the...

A. Dress Out Area

B. Security Building

C. ✔ Distribution Center

D. Operational Support Center

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires the knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes that personnel should enter the aux building based as it has filtered ventilation.*
*b. Incorrect. Plausible if the examinee incorrectly believes that assembly at the security building to facilitate protection of personnel by security forces.*
*c. Correct.*
*d. Incorrect. Plausible if the examinee incorrectly believes that assembly at the OSC is required to allow the OSC to be manned to effectively combat whatever issue has required the evacuation.*

K/A Number:
**2.1.14:**
Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.

K/A Value: 3.1

Technical Reference(s): PINGP 1125 Page 20 and 21

Proposed references to be provided to applicants during examination: PINGP 1125 Page 20 and 21

Learning Objective: P7410L-035 Obj. 2A

Determine and state the appropriate ED announcements including the appropriate plant announcements.

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

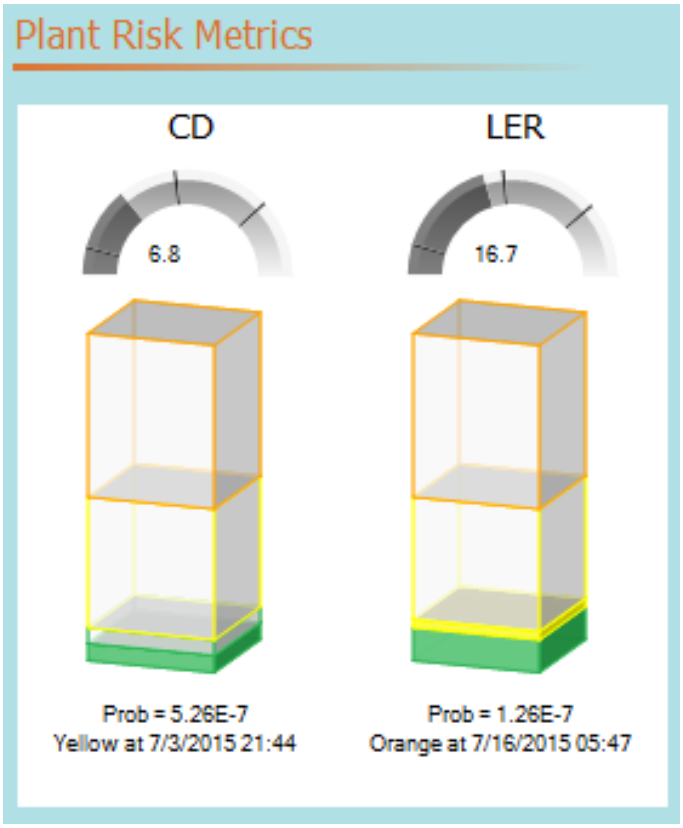
10 CFR Part 55 Content:
55.41 _
55.43 5

Comments:

21. P9150L-005 018/2.2.17/3.8/4/YES/P8100/FP-OP-RSK-01//2018 ILT NRC S96

- D2 Emergency Diesel Generator is Out of Service.
- Return to service of D2 is DELAYED.
- D2 is NOT predicted to be OPERABLE prior exceeding the TS LCO time limit.

- Current plant risk metrics are provided.




- FP-OP-RSK-01 Table 1, Risk Management Thresholds, Action Levels, Approval and Required Actions, is provided

The Risk Management Action Level is...

A. GREEN.

B. ✔ YELLOW.

C. ORANGE.

D. RED.

*3-SPR*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires the knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures.*

*Justifications:*
*a. Incorrect. Plausible if the examinee incorrectly believes that the lower risk indicator is used to determine the current risk management action level.*
*b. Correct.*
*c. Incorrect. Plausible if the examinee incorrectly believes that the delayed return to service causes an automatic risk management level increase.*
*d. Incorrect. Plausible if the examinee incorrectly believes that the risk of exceeding the TS time limit causes an automatic elevation to RED.*

K/A Number:
**2.2.17**
Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator..

K/A Value: 3.8

Technical Reference(s): FP-OP-RSK-01 pg 18

Proposed references to be provided to applicants during examination: FP-OP-RSK-01 pg 18

Learning Objective: P9150L-005 Obj. 4

Understand and execute the responsibilities of the RO or SRO in the implementation of the work management process.

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:

22. P8180L-003 076/2.2.15/4.3/4A/YES/P8100/TS 3.5.3 BASES//2018 ILT NRC S97

- Unit 1 is in MODE 4.


Per TS LCO 3.5.3, ECCS - Shutdown, which train(s) of RHR is(are) part of an OPERABLE train of ECCS?

| | A TRAIN | B TRAIN |
|---|---|---|
| A. | OPERABLE | OPERABLE |
| B. ✔ | OPERABLE | INOPERABLE |
| C. | INOPERABLE | OPERABLE |
| D. | INOPERABLE | INOPERABLE |

*3-SPK*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(2) Tech Specs. The question can NOT be answered by solely knowing < 1 hour TS actions OR by solely knowing the LCO "above the line" information OR by solely knowing TS Safety Limits. The question requires the knowledge of TS bases that is required to analyze TS required actions and terminology.*

*Justifications:*
*a. Incorrect. A train of ECCS is operable. Plausible if the examinee incorrectly believes that both trains of ECCS are operable if both trains of RHR are operable with regard to shutdown cooling.*
*b. Correct. A train of ECCS is operable. B train is aligned to shutdown cooling and is not operable as an ECCS train.*
*c. Incorrect. Plausible if the examinee incorrectly believes that the train of ECCS that is operable is the train of RHR that is in service.*
*d. Incorrect. B train is aligned to shutdown cooling and is not operable. Plausible if the examinee incorrectly believes that A train is not operable due to indicated CC flow of 0 gpm.*

K/A Number:
**2.2.15:**
Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.

K/A Value: 4.3

Technical Reference(s): TS LCO 3.5.3 Bases

Proposed references to be provided to applicants during examination: None

Learning Objective: P8180L-003 Obj. 4A

Describe the system flowpath and major components for normal operations

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 2

Comments:

23. P9130L-003 054/103 A2.02 / 2.3.12/3.7/5/YES/P8100/F2//2018 ILT NRC S98

- Unit 1 is at 100% power.
- Unit 2 is at 100% power.
- Flux Mapping is occurring on Unit 1.

Can a Unit 1 or Unit 2 Containment entry be made?

| | Unit 1 | Unit 2 |
|---|---|---|
| A. | YES | YES |
| B. | YES | NO |
| C.✔ | NO | YES |
| D. | NO | NO |

*2-RI*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(4) Radiation Hazards. This question can not be answered soley based on RO knowledge of radiological safety principles; e.g. RWP requirements, stay-time, DAC-hours. etc.*

*Justifications:*
*a. Incorrect. Containment entry on U2 is allowed. Plausible if examinee incorrectly believes that containment entry is allowed at any power level regardless of whether flux mapping is occurring with rad protection concurrence.*
*b. Incorrect. Plausible if the examinee incorrectly believes that flux mapping is required prior to containment entry when in mode 1 or 2.*
*c. Correct. Per F2, prior to making a containment entry in mode 1 or 2, the SS must confirm that flux mapping is not occurring and that shield building ventilation is off.*
*d. Incorrect. Containment entry on Unit 1 would not be allowed. Plausible if the examinee incorrectly believes that no containment entries are allowed at power similar to navy nuclear submarines.*

K/A Number:
**2.3.12:**
Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

K/A Value: 3.7

Technical Reference(s): F2 pg 27

Proposed references to be provided to applicants during examination: None

Learning Objective: P9130L-003 Obj.5

Using F2, determine the requirements for a containment entry.

Question Source: Bank # X
Modified Bank #
New

Question History: Last NRC Exam 2016 ILT AUDIT

Question Cognitive Level:
Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41
55.43 4

Comments:

24. P8140L-228 002/2.4.16/4.4/A.5/YES/P8100/C34 AOP1//2018 ILT NRC S99


- 47023-0502, INSTR AIR HEADER LO PRESS, is in ALARM.
- The Unit 1 crew is performing C34 AOP1, Loss of Instrument Air.

- BOTH units are TRIPPED manually.
- Immediate actions are COMPLETE.

- C34 AOP1 is provided.

The Unit 1 Shift Supervisor direct the crew to perform step (1) of C34 AOP1 (2) the remainder of 1E-0, Reactor Trip or Safety Injection.

A. ✔ (1) 2.4.5
(2) in PARALLEL with

B. (1) 2.4.5
(2) AFTER performing

C. (1) 2.6
(2) in PARALLEL with

D. (1) 2.6
(2) AFTER performing

*Justifications:*
*a. Correct.*
*b. Incorrect. Plausible if the examinee incorrectly believes that the AOP can not be performed until transitioning out of E-procedures.*
*c. Incorrect. Plausible if the examinee correctly believes that U2 containment does not have sufficient air pressure and incorrectly believes that 2.6 should be worked since pressure is remaining in the unit 2 header.*
*d. Incorrect. Plausible if the examinee correctly believes that U2 containment does not have sufficient air pressure and incorrectly believes that 2.6 should be worked since pressure is remaining in the unit 2 header and the examinee correctly believes that U2 containment does not have sufficient air pressure and incorrectly believes that 2.6 should be worked since pressure is remaining in the unit 2 header.*

K/A Number:
**2.4.16**
**Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and sever accident management guidelines**

K/A Value: 4.4

Technical Reference(s): C34 AOP1

Proposed references to be provided to applicants during examination: C34 AOP1

Learning Objective: P8140L-228 A5
For Procedure: C34 AOP1
Explain the Purpose and Sequence of Major Steps

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

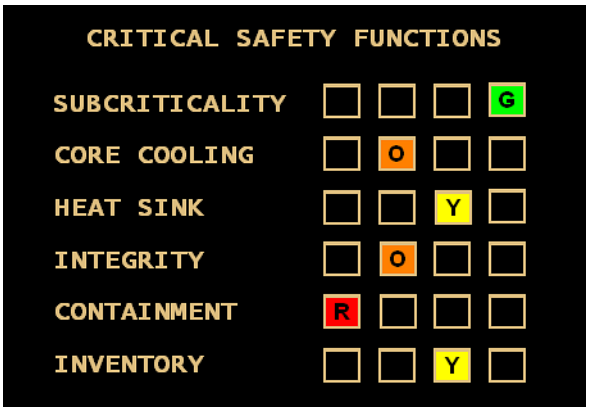
10 CFR Part 55 Content:
55.41 _
55.43 5

Comments:

25. P8197L-014 191/2.4.23/4.4/39/YES/P8100/F-0//2018 ILT NRC S100

- The crew has just transitioned to 1E-2, Faulted Steam Generator Isolation.
- 11 Steam Generator is faulted to containment.
- 12 Steam Generator is faulted to containment.

- Critical Safety Functions are as follows:




What is the NEXT procedure the Shift Supervisor will enter?

A. 1FR-C.2, Response to Degraded Core Cooling B.

✔ 1FR-Z.1, Response to High Containment Pressure

C. 1ECA-2.1, Uncontrolled Depressurization of Both Steam Generators

D. 1FR-P.1, Response to Imminent Pressurized Thermal Shock Condition

*3-SPK*

*EXPLANATION:*
*This question is linked to 10 CFR 55.43(b)(5) Assessment and selection of procedures. The question can NOT be answered by solely knowing "systems knowledge" OR by solely knowing immediate operator actions OR by solely knowing entry conditions for AOPs or plant parameters that require direct entry to MAJOR EOPs OR by solely knowing the purpose overall sequence of events or overall mitigative strategy of a procedure. The question requires the knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event specific sub-procedures or emergency contingency procedures.*
*This question is NOT RO because the answer and distractors all meet entry conditions. The SRO must decide which is the highest priority procedure with which to proceed.*

*Justifications:*
*a. Incorrect. Plausible if examinee incorrectly believes this should be entered because core cooling is higher on the CSF tree; however, in this case the highest priority is RED path CTMT.*
*b. Correct.*
*c. Incorrect. Plausible as E-2 directs a transition to ECA-2.1; however, F-0 requires CSF trees as higher priorities after transition from E-0.*
*d. Incorrect. Plausible if examinee incorrectly believes this is a higher priority because it's higher on the CSF tree; however, in this case RED path is highest priority.*

K/A Number:
**2.4.23**
**Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.**

K/A Value: 4.4

Technical Reference(s): F-0 page 2

Proposed references to be provided to applicants during examination: None

Learning Objective: P8197L-014 Obj 39.

For FR-Z.1, state the entry conditions for the associated E or FR series EOP.

Question Source: Bank # P8197L-014 191
Modified Bank #
New

Question History: Last NRC Exam 2015 LOR, 2014 AUDIT

Question Cognitive Level:
Memory or Fundamental Knowledge
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41
55.43 5

Comments:

**You have completed the test!**