

ILC-11-2 NRC Exam

1. 007 EG2.4.11 001

Given the following plant conditions:

- The unit has just experienced an automatic reactor trip from 100% RTP.
- The turbine failed to trip automatically.
- A manual turbine trip was initiated and the following indications are present:
 - Left Turbine Stop Valve indicates CLOSED
 - All Governor Valves indicate OPEN
- RCS pressure is 1860 psig
- T_{avg} is 542°F
- No SI equipment has actuated

<u>S/G</u>	<u>Pressure</u>	<u>Steam Flows</u>
A	895 psig	0.1×10^6 lbm/hr
B	915 psig	0.1×10^6 lbm/hr
C	835 psig	1.45×10^6 lbm/hr

Which ONE (1) of the following identifies the required operator response IAW PATH-1?

Runback the turbine until....

- A✓ ALL Governor Valves indicate CLOSED AND verify TWO (2) charging pumps running
- B. at least the Right Upper and Right Lower Governor Valves indicate CLOSED (all Governor Valves not required to indicate closed) AND verify TWO (2) charging pumps running
- C. ALL Governor Valves indicate CLOSED AND manually initiate SI
- D. at least the Right Upper and Right Lower Governor Valves indicate CLOSED (all Governor Valves not required to indicate closed) AND manually initiate SI

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The correct answer is A.

A. Correct - During PATH-1 immediate actions if the turbine is not tripped then the turbine is runback until all the governor valves are closed. SI is not required since the coincidence for high steam line D/P and High Steam Flow have not been met.

B. Incorrect. PATH-1 requires that either both turbine stop valves OR ALL governor valves be closed to consider the turbine tripped. In this distractor the left stop valve would be closed and the right set of governor valves. This would meet the coincidence for a generator lockout, but not for declaring the turbine tripped. The second part of the distractor is correct.

C. Incorrect - The first part of the distractor is correct. SI is not required since the coincidence for high steam line D/P and High Steam Flow have not been met.

D. Incorrect - PATH-1 requires that either both turbine stop valves OR ALL governor valves be closed to consider the turbine tripped. In this distractor the left stop valve would be closed and the right set of governor valves. This would meet the coincidence for a generator lockout, but not for declaring the turbine tripped. The second part of the distractor is incorrect since no SI setpoint has been exceeded. The high steam flow with low Tave coincidence is not met since only one S/G has excessive steam flow. Also, the high steam line D/P is not met.

Question 1

Tier/Group 1/1

K/A Importance Rating - RO 4.0 SRO 4.2

Reactor Trip: Knowledge of abnormal condition procedures.

Reference(s) - Sim/Plant design, PATH-1, PATH-1 bases, ESFAS Logics

Proposed References to be provided to applicants during examination - None

Learning Objective - PATH-1-003

Question Source - BANK (Not used in an NRC Exam from 2004 to present.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.13

Comments -

MAB Comments: Is it operationally valid to provide a reactor trip in the stem without providing the power level at the time of trip? This seems a bit artificial, like you are withholding obvious information just to try to make the question work. **Added initial power level.**

“Not tripped” does not appear to be plausible. When all turbine stop valves are closed, then the turbine is effectively tripped, regardless of what the basis document states **Revised answers to remove "Not tripped". Changed answers to focus on requirements to runback the turbine to meet the requirements of PATH-1.**

Added "IAW PATH-1" to stem due to validation comments.

2. 008 AK2.03 001

Given the following plant conditions:

- The plant is at 100% RTP.
- PC-444J, PZR PRESS, has failed **HIGH**.

Assuming **NO** operator actions are taken, which ONE (1) of the following completes the following statement?

The FIRST reactor trip signal will be generated when the reactor protection (1) setpoint is exceeded.

PCV-455C, PZR PORV, will receive a closed signal once pressurizer pressure lowers below (2) psig.

A. ✓ (1) OTdeltaT

(2) 2000

B. (1) Low Pressurizer Pressure

(2) 2000

C. (1) OTdeltaT

(2) 2185

D. (1) Low Pressurizer Pressure

(2) 2185

The correct answer is A.

A. Correct.

B. Incorrect - At 100% RTP the failed open PORV will have a large impact on the OTdeltaT setpoint. It has been proven on numerous scenarios on the simulator that the reactor will trip on OTdeltaT vice Low Pressurizer Pressure at high power levels. At low power levels the Low Pressurizer Pressure setpoint will typically be the cause of the reactor trip. The second part of the distractor is correct.

C. Incorrect - The first part of distractor is correct. The second part is incorrect. The pressurizer pressure protection channels will provide an input to close PCV-455C once pressure has lowered below 2000 psig. 2185 psig is the low pressurizer pressure alarm setpoint.

D. Incorrect - At 100% RTP the failed open PORV will have a large impact on the OTdeltaT setpoint. It has been proven on numerous scenarios on the simulator that the reactor will trip on OTdeltaT vice Low Pressurizer Pressure at high power levels. At low power levels the Low Pressurizer Pressure setpoint will typically be the cause of the reactor trip. The second part is incorrect. The pressurizer pressure protection channels will provide an input to close PCV-455C once pressure has lowered below 2000 psig. 2185 psig is the low pressurizer pressure alarm setpoint.

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Question 2

Tier/Group 1/1

K/A Importance Rating - RO 2.5 SRO 2.4

Knowledge of the interrelations between the Pressurizer Vapor Space Accident and the following: Controllers and positioners

Reference(s) - Sim/Plant design, System Description, RPS / ESFAS Logics

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-019-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.6 / 45.4

Comments -

MAB Comments: What other meaningful pressure values can be used other than 1715? Your chosen value seems so low that it becomes not plausible. It does not make sense that the PORV would be allowed to remain open until well after your reactor trip setpoint of 1844 psig and at the point of SI. This question will be satisfactory if you can address this plausibility concern with two of the distractors. This question will be considered an E due to the fix being relatively easy, although technically two answer choices are affected. 2185 psig may be a better choice to consider – at least it is prior to a reactor trip and SI.

Changed 1715 psig to 2185 psig.

3. 009 EK2.03 001

Given the following plant conditions:

- A LOCA has occurred.
- RCS pressure is 1100 psig and lowering.
- Containment pressure had peaked at 12 psig.
- The crew is performing actions of EPP-8, Post LOCA Cooldown and Depressurization.

Which ONE (1) of the following identifies the method that will be used to initiate cooldown of the RCS?

Initiate cooldown using the...

- A. steam dumps at the maximum achievable rate.
- B. steam dumps at no greater than 100°F per hour.
- C. S/G PORVs at the maximum achievable rate.
- D. S/G PORVs at no greater than 100°F per hour.

The correct answer is D.

A. Incorrect - Steam dumps are not available due to the MSIVs receiving a main steam line isolation signal at 10 psig CV pressure. Several EOPs procedures direct the operator to cooldown at maximum achievable rate.

B. Incorrect - Steam dumps are not available due to the MSIVs receiving a main steam line isolation signal at 10 psig CV pressure. Steam dumps are the preferred means of cooling down, if available. The cooldown rate is correct.

C. Incorrect. The first part of distractor is correct. Several EOPs procedures direct the operator to cooldown at maximum achievable rate. A 100° F/hr limit is utilized to preclude violation of the Integrity Status Tree thermal shock limits.

D. Correct.

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Question 3

Tier/Group 1/1

K/A Importance Rating - RO 3.0 SRO 3.3

Knowledge of the interrelations between the small break LOCA and the following: S/Gs

Reference(s) - Sim/Plant design, EPP-8, ESFAS Logics, EOP Network

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-8-004

Question Source - BANK (Used on 2007 NRC Exam.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.7

Comments -

4. 011 EK 2.02 001

Given the following plant conditions:

- A Large Break LOCA has occurred from 100% RTP.
- Containment pressure is 23 psig and rising.
- PATH-1 is being implemented.
- The CRS has directed the RO to trip the RCPs.

Which ONE (1) of the following is the basis for tripping the RCPs?

- A. Allowing the RCPs to run would hinder Accumulator injection due to turbulent two-phase flow characteristics in loops.
- B✓ Tripping the RCPs will protect them from overheating due to loss of cooling water.
- C. Allowing the RCPs to run would force more water out of the break and cause core uncover sooner.
- D. Tripping the RCPs allows the loop seal to clear thus minimizing RCS inventory loss.

The correct answer is B.

A. Incorrect - The accumulators will inject during a large break LOCA in an effort to recover and cool the core. Forced flow will not impact the ability of the accumulators to inject their fluid due to the expected differential pressure.

B. Correct - During a LBLOCA a phase B signal will be received. This will isolate CCW cooling to the RCPs. The RCPs are therefore secured due to the loss of cooling water.

C. Incorrect - This is the basis for stopping RCPs during a SBLOCA. During a SBLOCA the RCPs will be secured once SI flow is verified as being capable of injecting and Subcooling below the threshold of 35°F.

D. Incorrect - Depending on break location, once the loop seal has been cleared then the break flow could become steam and lower the break flow. This is not associated with the requirement to trip the RCPS.

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Question 4

Tier/Group 1/1

K/A Importance Rating - RO 2.6 SRO 2.7

Knowledge of the interrelations between the following and a Large Break LOCA:
Pumps:

Reference(s) - Sim/Plant design, PATH-1 Basis Document

Proposed References to be provided to applicants during examination - None

Learning Objective - PATH-1

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7 / 45.7

Comments -

MAB Comments: This question will not be counted toward the number of unsat questions. The KA requires testing Large Break LOCA knowledge. I am not sure how natural circulation cooling and reflux boiling impact a LBLOCA. The question was written for a very small LOCA – a break size for which NC cooling / reflux boiling actually makes sense. I think a new KA is required. We can discuss further if necessary, otherwise you will need to write a question to the replacement KA.

NEW KA: 011EK2.02 (IR=2.6)

5. 015 AK2.08 001

Given the following plant conditions:

At time 1852

- The plant experienced a reactor trip from 100% RTP.
- 480V Bus E-2 de-energized and operators manually energized the bus from its associated EDG.

At time 1918

- PCV-1716, Instrument Air Isolation to CV, failed closed and Air Operated Valves in Containment are repositioning to their fail position.

Which ONE (1) of the following completes the statement below?

At time 1933, RCP motor bearing temperatures will (1) and RCP seal leakoff temperatures will (2) the associated alarm setpoint.

A. (1) rise

(2) rise above

B. (1) rise

(2) remain below

C. (1) remain approximately constant

(2) rise above

D. (1) remain approximately constant

(2) remain below

The correct answer is D.

A. Incorrect - In this situation, CVC-310A will fail open due to the loss of IA to containment. This will cause an initial increase in the charging flow through the charging path and a momentary lowering of the seal injection flow. The reduction in seal injection flow will cause the seal leakoff temperatures to rise approximately 1°F and then eventually lower back to the original value. A momentary loss of E-2 will cause a momentary loss of the ability to run "C" CCW pump. However, "A" and "B" CCW pumps are available and CCW flow to the RCPs will not be impacted. The motor bearing temperatures will remain relatively constant. To make this selection the candidate would have to assume that CCW was impacted by the events described.

B. Incorrect - See discussion in "A" above. To make this selection the candidate would have to assume that CCW was impacted and seal injection flow remained the same. The candidate must demonstrate knowledge of air operated valve fail positions and their impact on plant operations. The second half of distractor is correct.

C. Incorrect - The first part of distractor is correct. In this situation, CVC-310A will fail open due to the loss of IA to containment. This will cause an initial increase in the charging flow through the charging path and a momentary lowering of the seal injection flow. The reduction in seal injection flow will cause the seal leakoff temperatures to rise approximately 1°F and then eventually lower back to the original value. With two charging pumps running the PZR level will remain in its normal band. RCP Seal Leakoff temperatures are usually between 115°F and 130°F and will only rise a maximum of one degree before beginning to lower. The alarm setpoint for the RCP Seal Leakoff is 170°F.

D. Correct

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Question 5

Tier/Group 1 / 1

K/A Importance Rating - RO 2.6 SRO 2.6

Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: CCWS

Reference(s) - Sim/Plant design, AOP-018, AOP-017, System Description, CVCS P&ID

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-014-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.7

Comments - **Approved by MAB. Revised per phone discussion on 10/12/11 to test whether the seal leakoff temperatures rise or remain the same. Subsequently, further runs were performed on the simulator and determined that seal leakoff temperatures only rise about 1°F and then begin to lower. Never approached the Seal Leakoff High Temperature alarm.**

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6. 022 AA2.03 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- RCS Makeup System is properly aligned and an Auto makeup is in progress.
- The air supply line to FCV-114A, Primary Water Flow Dilute Mode, severed ONE (1) minute ago.

Which ONE (1) of the following identifies the failed position of FCV-114A and expected alarm?

FCV-114A will fail (1) and APP-003-D5, BA FLOW DEV, (2) be received.

A. (1) OPEN

(2) will

B. (1) OPEN

(2) will NOT

C✓ (1) CLOSED

(2) will

D. (1) CLOSED

(2) will NOT

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The correct answer is C.

A. Incorrect - FCV-114A will fail closed. Candidate may think that the valve will fail open to allow for ability to makeup to the VCT on a failure of the valve. The second part of the distractor would be correct since the primary water flow would still exceed your pre-set flow values and FCV-113B, Blended MU to CHG SUCT, would close. With FCV-113B closed all BA flow would stop and result in a BA FLOW DEV alarm.

B. Incorrect. FCV-114A will fail closed. Candidate may think that the valve will fail open to allow for ability to makeup to the VCT on a failure of the valve. The second part of distractor is partially correct assuming that FCV-114A failed open. FCV-114A full open would cause primary water flow to exceed the pre-set flow values. However, the BA FLOW DEV alarm will also be received due to ALL makeup flow being isolated, including BA flow. Candidate may thin that BA flow will not be impacted.

C. Correct - FCV-114A will fail closed on a loss of air. This will result in primary water flow being less than the preset value and will result in a makeup water deviation alarm. This will close FCV-113B which will isolate all makeup flow to the VCT. This will result in a BA FLOW DEV alarm.

D. Incorrect - FCV-114A will fail closed on a loss of air. This will result in primary water flow being less than the preset value and will result in a makeup water deviation alarm. This will close FCV-113B which will isolate all makeup flow to the VCT. This will result in a BA FLOW DEV alarm. Candidate may focus in on the fact that the failure was associated with the primary water flow control valve and not remember that this will result in all makeup flow being isolated, including BA flow.

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Question 6

Tier/Group 1/1

K/A Importance Rating - RO 3.1 SRO 3.6

Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: Failures of flow control valve or controller

Reference(s) - Sim/Plant design, OP-301, AOP-003, APP-003-D5/E5, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-003-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 43.5 / 45.13

Comments -

MAB Comments: Question is backward logic, which presents some of the following concerns. **Revised the question to give the air line break and then ask for valve fail position and expected alarm(s).**

How do you know what HAS caused the alarm? Could a different failure cause 113B to fail closed? Would it be more appropriate to test what a possible, or viable, single failure could cause the alarms?

The second part of "B" and "C" is not needed – it is just extra information. Those two choices should just state that the air line has been completely severed. Delete ", causing the valve to fail CLOSED." **Added to the stem that the air line was severed.**

How does letdown have any impact on the two stated alarms? These alarms appear to be only applicable to the makeup. "D" does not appear to be plausible. Discuss with licensee to enhance understanding of plausibility. **Removed. Reworded question.**

How would the charging pump suction impact the two stated alarms? Discuss plausibility of "A". Also, since the applicant is forced to assume failures, is there a failure or combination of failures that could make "A" potentially correct. **Removed. Reworded the question.**

Added "ONE (1) minute ago." to last bullet in stem from validation comments.

7. 025 AK3.01 001

Which ONE (1) of the following identifies the basis for closing FCV-605, RHR HX Bypass Valve, and HCV-758, RHR HX Outlet Flow To Cold Legs, prior to starting the standby RHR Pump IAW AOP-020, Loss of RHR (Shutdown Cooling), Section E, Loss of RHR Flow or Temperature Control?

- A. Prevent cavitation of the pump.
- B✓ Reduce the pump starting current and prevent pump runout.
- C. Prevent water hammer damage to the RHR Heat Exchangers.
- D. Control the introduction of cooler water from the stagnant water in the suction and discharge piping of the standby pump.

The correct answer is B.

A. Incorrect - Several AOPs and other Operations procedures address RHR pump cavitation as a concern. In this case there was no impact to NPSH, so cavitation is not a concern.

B. Correct - AOP-020 basis document states that the valves are closed to limit the starting current on the pump. OP-201 states that a RHR Pump should not be started with FCV-605 in automatic as this could allow runout of the pump before the control valve could respond.

C. Incorrect - Although some water hammer effects may be felt, this is not the basis for the decision for closing the stated valves. Additionally, the RHR Heat Exchangers will be exposed to a pressure transient when starting the standby pump since the stated valves are downstream of the RHR Heat Exchangers.

D. Incorrect - Although some cooler water may be present in the discharge and suction line of the stagnant pump, this is not the basis for the actions.

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Question 7

Tier/Group 1/1

K/A Importance Rating - RO 3.1 SRO 3.4

Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Shift to alternate flowpath

Reference(s) - Sim/Plant design, AOP-020BD, OP-201, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-020-004

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.5 / 41.10 / 45.6 / 45.13

Comments - Discussion with P. Capehart on 6/15/11: Discussed that RNP does not have alternate flowpaths or other inter-connected systems. Agreed to prepare a question based on losing one operating pump and having to take action to place the standby train in service.

MAB comment: This question appears to be (F)undamental LOK, not (H)igher. Memory item for the reasons for doing the steps. Discuss. **Changed to LOK F.**

No further comments. Intent of the KA is considered to be met.

8. 027 AA1.05 001

Given the following plant conditions:

- EPP-1, Loss of All AC Power, is being implemented.
- The DS Bus has been energized IAW EPP-1, Attachment 6, Restoring AC Power At the DSDG Generator Control Panel.
- EPP-22, Energizing Plant Equipment Using DSDG, Attachment 1, Energizing Pressurizer Heaters from DS Bus, has been completed and specified heaters energized.
- PC-444J, PZR PRESS, has **FAILED** to 0% output.

Which ONE(1) of the following identifies the alternate method to control pressurizer heaters IAW EPP-22 based on the conditions given above?

- A. Operate breakers on Pressurizer Htr Panel #3 Control Group
- B. Operate breaker 52/15B, 480V Bus 3 Main Bkr from the RTGB
- C✓ Operate breaker 52/12B, 480V Bus 2B-3 Tie Bkr from the RTGB
- D. Operate the PZR Heater Emergency Control Station in the Rod Control Room

The correct answer is C.

A. Incorrect - This action would control power to the control group heaters, however, this panel is in the Rod Control Room and would not provide desired control to the control board operators. Additionally, this option is not specified in EPP-22.

B. Incorrect - Opening this breaker would remove power to 480V Bus 3 and 2B and thus the control group heaters. This is not a desired method due to other loads that may have been started on 480V Bus 3 when it was energized by the DSDG.

C. Correct. The preferred method is to adjust PC-444J in manual to control the amount of firing to the control group heaters. However, since PC-444J has failed to 0% output the heaters will be receiving full firing rate when energized.

D. Incorrect - Two PZR Heater Emergency Control Stations are located in the Rod Control Room. These control stations are utilized in AOP-004, Control Room Inaccessibility, to control the heaters. The Emergency Control Stations control Backup Group A and Backup Group B.

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Question 8

Tier/Group 1/1

K/A Importance Rating - RO 3.3 SRO 3.2

Ability to operate and / or monitor the following as they apply to the Pressurizer
Pressure Control Malfunctions: Transfer of heaters to backup power supply

Reference(s) - Sim/Plant design, EPP-22, System Descriptions

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-22-006

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.5 / 45.6

Comments - Discussed with P. Capehart on 6/15/11: Discussed that RNP does not have an installed, dedicated backup power supply to pressurizer heaters. Agreed to write question based on manipulating electric plant lineup to supply alternate power to pressurizer heaters in accordance with applicable EOP procedure(s).

9. 029 EG2.4.49 001

Given the following plant conditions:

- An ATWS has occurred.
- The crew is performing immediate actions of FRP-S.1, Response to Nuclear Power Generation/ATWS.
- A manual reactor trip using both RTGB pushbuttons was unsuccessful.
- Rods are being inserted in MANUAL.
- IAO and OAO have been dispatched to locally trip the reactor.
- The THINK and Manual Turbine Trip Buttons have been depressed.
- Main Turbine Governor and Stop Valves indicate open.

Which ONE (1) of the following identifies the **NEXT** required action(s) that must be taken IAW FRP-S.1?

- A. Close all MSIVs and MSIV Bypasses.
- B. Depress and hold the GV Down and GV Fast pushbuttons.
- C. Depress the turbine manual pushbutton and then depress and hold the the GV Down pushbutton ONLY.
- D✓ Depress the turbine manual pushbutton and then depress and hold the GV Down and GV Fast pushbuttons.

The correct answer is D.

A. Incorrect. A run back of the turbine is to be attempted prior to closing the MSIVs and MSIV bypasses.

B. Incorrect. The turbine manual pushbutton must be depressed and released prior to performing the action given in this distractor.

C. Incorrect. These actions will begin to run back the turbine, but not at maximum rate as called for in FRP-S.1. In order to go at the maximum rate, the GV Fast pushbutton must be depressed.

D. Correct.

Question 9

Tier/Group 1/1

K/A Importance Rating - RO 4.6 SRO 4.4

Anticipated Transient Without Scram (ATWS): Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Reference(s) - Sim/Plant design, FRP-S.1, PATH-1, OMM-022, Sys. Description

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-S.1-003

Question Source - BANK (Not used on NRC Exam from 2004 to present.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 43.2 / 45.6

Comments -

MAB Comments: In the correct answer, why would the applicant push the GV Down and GV Fast buttons if the turbine manual pushbutton was successful? Are the applicants forced to make an assumption here? NUREG-1021 states that applicants are not to make assumptions, therefore they could conclude the turbine trip was successful. **Revised wording to state that "The THINK and Manual Turbine Trip Buttons have been depressed" rather than simply stating that a "manual trip of turbine was unsuccessful."**

The question statement asks for the next (singular) required action, yet the correct answer is a list of several actions. Same comment can be applied to other answer choices where more than one action is provided. **Revised action to action(s).**

What immediate actions have already been performed? The stem does not provide this information. This forces the applicant to make assumptions as to where they are in the procedure. This creates multiple correct answers. **Added additional immediate actions of FRP-S.1 to the stem.**

The question wording and presentation needs to be tightened to ensure one and only one correct answer. **Wording revised.**

10. 038 EK1.04 001

Given the following plant conditions:

- The plant was operating at 100% RTP.
- The plant has experienced a S/G tube rupture with a Loss of Coolant Accident.
- Current RCS level is at the hot leg centerline.
- No SI flow exists due to multiple malfunctions.

Which ONE (1) of the following identifies how the majority of the heat is removed from the core for the given conditions?

Boiling in the core produces steam which condenses in....

- A. the reactor vessel annular space and re-floods the core.
- B. the upper head and re-floods the core via the upper internals.
- C. the S/G tubes and flows down the cold leg back to the core.
- D✓ the S/G tubes and flows down the hot leg back to the core.

The correct answer is D.

A. Incorrect - Steam flows along the top of the hot legs to the steam generator where it condenses and returns to the core via the bottom of the hot leg piping.

B. Incorrect - If the upper head was cool the steam could condense and return to the core. However, the upper head will remain at a high temperature following a LOCA and minimal condensation will occur in the reactor vessel.

C. Incorrect - Steam flows along the top of the hot legs to the steam generator where it condenses and returns to the core via the bottom of the hot leg piping. It would seem intuitive that the condensation would re-enter the reactor vessel via the normal flowpath which is the cold leg, however, based on elevation changes, etc., this is not the case.

D. Correct.

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Question 10

Tier/Group 1/1

K/A Importance Rating - RO 3.1 SRO 3.3

Knowledge of the operational implications of the following concepts as they apply to the SGTR: Reflux boiling

Reference(s) - Sim/Plant design, PATH-1-BD

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-C.1-003

Question Source - BANK (Similar question used on 2007 NRC Exam. Question modified significantly.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.8 / 41.10 / 45.3

Comments - Discussed with P. Capehart on 6/15/11: Discussed concern with having two K/As selected that addressed reflux boiling. (see T1G1 011EK1.01) Agreed to attempt to write a question on the operational implication of reflux boiling associated with a SGTR. K/A may be replaced at a later date if extreme difficulty is experienced in developing an acceptable question.

MAB Comment: The licensee should produce supporting documentation for flow returning to the core via the hot leg. The provided documentation only states that reflux boiling will occur, but does not define that reflux boiling is entirely limited to returning flow to the core via the hot leg.

11. 054 AA1.04 001

Given the following plant conditions:

- Plant had been operating at 100% RTP for 285 days prior to a plant trip and safety injection occurring.
- The crew is performing actions of FRP-H.1, Response to Loss of Secondary Heat Sink.
- Plant conditions require that an RCS Bleed and Feed be performed.

Which ONE(1) of the following completes the statement below?

To ensure adequate RCS Injection flow a MINIMUM of (1) safety injection pump(s) are/is required to be running AND (2) PZR PORV(s) will be opened to provide an adequate RCS Bleed path.

A. (1) one

(2) one

B✓ (1) one

(2) two

C. (1) two

(2) one

D. (1) two

(2) two

The correct answer is B.

A. Incorrect - The first part of the distractor is correct. Per FRP-H.1 basis document the RCS may not depressurize sufficiently to permit adequate feed of subcooled SI flow to remove core decay heat. If both PORVs cannot be opened, FRP-H.1 will direct the operator to open the RV head and PZR vents.

B. Correct.

C. Incorrect - FRP-H.1 will direct the operator to initiate a safety injection signal. This should start both SI pumps. However, FRP-H.1 later has the operator verify that at least one SI pump is running. Per FRP-H.1 basis document the RCS may not depressurize sufficiently to permit adequate feed of subcooled SI flow to remove core decay heat. If both PORVs cannot be opened, FRP-H.1 will direct the operator to open the RV head and PZR vents.

D. Incorrect - FRP-H.1 will direct the operator to initiate a safety injection signal. This should start both SI pumps. However, FRP-H.1 later has the operator verify that at least one SI pump is running. The second part of the distractor is correct.

Question 11

Tier/Group 1/1

K/A Importance Rating - RO 4.4 SRO 4.5

Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW): HPI, under total feedwater loss conditions

Reference(s) - Sim/Plant design, FRP-H.1, FRP-H.1BD

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-H.1-004

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7 / 45.5 / 45.6

Comments - Discussion with P. Capehart on 6/15/11: Confirmed that it would be acceptable to focus on Bleed and Feed conditions / actions for a loss of Heat Sink to address "HPI, under total feedwater loss conditions."

MAB Comments: The procedure has the operator start at least one SI pump and open both PORVs. Will opening one PORV provide adequate cooling, which is what the question is asking? No supporting documentation is provided to support that two PORVs are required for adequate cooling. This question will be rated as satisfactory if sufficient documentation can show one and only one correct answer.

Page 56 and 57 of FRP-H.1-BD contains the necessary information.

12. 055 EG2.1.31 001

Given the following plant conditions:

- Reactor power is at 100% RTP.
- A Generator Lockout occurs simultaneously with a loss of the Startup Transformer.
- Both EDGs fail to start.

Which ONE (1) of the following completes the statements below?

For the conditions given above, IAW EPP-1, Loss of All AC Power, steam is verified isolated to the Turbine by (1) and (2) are required to be CLOSED to isolate letdown flow.

- A✓ (1) closing the MSIVs AND MSIV Bypasses
 (2) LCV-460A/B, Letdown Line Stop Valves
- B. (1) closing the MSIVs and MSIV Bypasses
 (2) CVC-204A/B, Letdown Line Isolation Valves
- C. (1) verifying BOTH Turbine Stop Valves CLOSED
 (2) LCV-460A/B, Letdown Line Stop Valves
- D. (1) verifying BOTH Turbine Stop Valves CLOSED
 (2) CVC-204A/B, Letdown Line Isolation Valves

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The correct answer is A.

A. Correct.

B. Incorrect - First part of distractor is correct. The MSIVs must be closed. The loss of the SUT will cause the EH Control Panel to be de-energized and the operator will be unable to confirm that the Turbine Stop Valves are closed. This will require that the MSIVs be closed. CVC-204A/B will isolate letdown if closed, however, EPP-1 directs the operator to close LCV-460A/B. If LCV-460A/B cannot be closed the RNO is to close CVC-200A,B,C.

C. Incorrect - The MSIVs must be closed. The loss of the SUT will cause the EH Control Panel to be de-energized and the operator will be unable to confirm that the Turbine Stop Valves are closed. This will require that the MSIVs be closed. The second part of the distractor is correct.

D. Incorrect- The MSIVs must be closed. The loss of the SUT will cause the EH Control Panel to be de-energized and the operator will be unable to confirm that the Turbine Stop Valves are closed. This will require that the MSIVs be closed. CVC-204A/B will isolate letdown if closed, however, EPP-1 directs the operator to close LCV-460A/B. If LCV-460A/B cannot be closed the RNO is to close CVC-200A,B,C.

Question 12

Tier/Group 1 / 1

K/A Importance Rating - RO 4.6 SRO 4.3

Loss of Offsite and Onsite Power (Station Blackout): Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.

Reference(s) - Sim/Plant design, EPP-1, PATH-1

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-1-003

Question Source - RNP Bank (Not used on NRC Exam from 2004 to present.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 45.12

Comments - K/A match because candidate is given the EH Turbine Control indications that show two governor valves open and one stop valve open after a reactor trip followed by a Station Blackout. The candidate must evaluate the indications and determine that the MSIVs and MSIV Bypass Valves must be closed.

Reviewed and approved by MAB.

13. 056 AK1.03 001

Given the following plant conditions:

- The reactor has tripped due to a loss of off-site power.
- Natural circulation flow is being established.
- The Subcooling Monitor indicates the following information:
 - T/C at B07 558°F
 - T/C at H04 555°F
 - T/C at D05 556°F
 - T/C at R08 554°F
- The RTGB indicates the following information:
 - PI-445: 1800 psig
 - PI-456: 1785 psig
 - PI-457: 1795 psig

Determine the current value of subcooling that will be utilized while in the EOP Network.

- A. 60.8 - 62.5°F
- B✓ 62.8 - 64.5°F
- C. 64.8 - 66.5°F
- D. 66.8 - 68.5°F

The correct answer is B.

A. Incorrect. For this distractor the candidate utilizes the highest temperature and the lowest pressure without converting to psia. 1785 psia has a T_{sat} of 619.85°F. Subtracting 558°F from 619.85°F equals 61.85°F of subcooling.

B. Correct. The lowest pressure of 1785 psig and the highest temperature of 558°F are to be used to calculate subcooling. 1785 psig equates to 1800 psia, which has a T_{sat} of 621.02°F. Subtracting 558°F from 621.02°F equals 63.02°F of subcooling.

C. Incorrect. The candidate would have to incorrectly utilize the lowest indicated pressure of 1785 psig without converting to psia and the lowest given temperature of 554°F to calculate S/C. 1785 psia equates to a T_{sat} of approximately 619.85°F. Subtracting 554°F from 619.85°F equals 65.85°F subcooling.

D. Incorrect. The candidate would have to incorrectly utilize the lowest indicated pressure of 1785 psig and the lowest given temperature of 554°F to calculate S/C. 1785 psig equates to a T_{sat} of approximately 621.02°F. Subtracting 554°F from 621.02°F equals 67.02°F subcooling.

Question 13

Tier/Group 1/1

K/A Importance Rating - RO 3.1 SRO 3.4

Knowledge of the operational implications of the following concepts as they apply to
Loss of Offsite Power: Definition of subcooling: use of steam tables to determine it

Reference(s) - Sim/Plant design, Steam Tables, OP-307

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-1-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.8 / 41.10 / 45.3

Comments -

MAB Comment:

Plausibility needs to be enhanced by using 1785 psig without converting to psia. For example, 61.85 F would be the resultant SCM when 1785 psia is used in conjunction with 558F. **Revised as recommended.**

Also, does your temperature display have a mechanism for notifying an operator that the T/C reading is not reliable and should not be used (I.E. turns a different color)? If so, I would like this to be used along with failing to convert the 1785 psig to psia. **No, the temperature display does not have any mechanism for informing the operator that the reading is reliable or not.**

In summary, make the answer choices similar to the following convention:

- A. Lowest P and Highest Temp
- B. Lowest P without converting to psia and Highest Temp
- C. Lowest P and Lowest Temp (or preferably a higher invalid T/C temp)
- D. Lowest P without converting to psia and Lowest Temp (or preferably a higher invalid T/C temp)

Revised as recommended.

The plausibility can be fixed with a small effort, therefore this question is rated as an "E".

Revised the answer and distractors to change the given bands to account for applicant to use 14.7 psig vice 15 psig to convert to psia. Comment a result of validation comment.

14. 057 AA2.04 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- A loss of Instrument Bus 2 has occurred.

Which ONE (1) of the following completes the statement below?

Safeguards Train (1) Sequencer is currently de-energized and (2).

A. (1) "A"

(2) bistable Status Panel "A" will be de-energized

B. (1) "B"

(2) bistable Status Panel "A" will be de-energized

C✓ (1) "A"

(2) channel 2 bistables on Status Panel "A" will be illuminated with the exception of CV HI-HI Pressure

D. (1) "B"

(2) channel 2 bistables on Status Panel "A" will be illuminated with the exception of CV HI-HI Pressure

The correct answer is C.

A. Incorrect - First part of distractor is correct. Status Panel "A" is powered from IB-3 and will therefore remain energized.

B. Incorrect - Safeguard Train "A" is powered from IB-2. Status Panel "A" is powered from IB-3 and will therefore remain energized.

C. Correct.

D. Incorrect - Safeguard Train "A" is powered from IB-2. The second part of the distractor is correct.

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Question 14

Tier/Group 1/1

K/A Importance Rating - RO 3.7 SRO 4.0

Ability to determine and interpret the following as they apply to the Loss of Vital AC
Instrument Bus: ESF system panel alarm annunciators and channel status indicators

Reference(s) - Sim/Plant design, APP-002-B2, AOP-024, AOP-024BD

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-024-002

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 43.5 / 45.13

Comments -

15. 058 AA1.03 001

Given the following plant conditions:

- Plant was operating at 100% RTP.
- A loss of "A" DC Bus occurs.

FIVE (5) minutes later, which ONE (1) of the following identifies the expected plant response due to the loss of "A" DC Bus?

	<u>Safety Injection Actuation</u>	<u>Exciter Field Bkr Auto Trips</u>
A.	YES	YES
B.✓	YES	NO
C.	NO	YES
D.	NO	NO

The correct answer is B.

A: Incorrect - The first distractors is correct. The Exciter Field Bkr will not open due to a loss of control power. Foldout "A" contains steps to dispatch personnel to open the exciter field breaker on a loss of "A" DC bus. The Exciter Field Bkr will trip on a loss of "B" DC Bus.

B: Correct

C: Incorrect - Candidate may not remember that Instrument Bus 1 is lost due to the loss of E-1 resulting in the SI. Candidate may also think that there is not relationship between a loss of DC power with the Exciter Field breaker since a Generator Lockout will still occur from the 86BU.

D: Incorrect - See discussion in "C" above for SI Actuation. The second part of distractor is correct.

Question 15

Tier/Group 1/1

K/A Importance Rating - RO 3.1 SRO 3.3

Ability to operate and / or monitor the following as they apply to the Loss of DC Power:
Vital and battery bus components

Reference(s) - Sim/Plant design, EPP-26/27, EPP-26/27BD

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-26-008

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.5 / 45.6

Comments -

MAB Comments: Why are so many columns used? Generally good question writing practice would suggest that only the info needed to make 4 unique answer choices should be used. With that stated, can the answer choices be limited to only the first and last column (SI Actuation and Exciter Field Breaker)? The extra information typically just weakens the plausibility of the distractors by providing additional ways to disqualify those distractors. **Deleted the PCV-1922 and 4KV Buses 1 & 2 columns.**

Added "FIVE (5) minutes later," to the stem of the question to ensure that the turbine coastdown had occurred and a loss of E1 bus. The loss of E1 gives the SI signal. Based on validation comments.

16. 065 AA2.05 001

Given the following plant conditions:

- Plant is at 35% RTP.
- APP-002-E7, INST AIR COMP D TRIP, illuminates.
- APP-002-F7, INST AIR HDR LO PRESS, illuminates.
- AOP-017, LOSS OF INSTRUMENT AIR, is entered.
 - Station Air and Instrument Air have been cross-connected.
 - Transition has been made to AOP-017, Section A, Modes 1 AND 2.
 - Instrument Air pressure is 64 psig.
 - "B" and "C" S/Gs Levels are at 42% and slowly lowering.

Which ONE (1) of the following completes the statement below?

The operating crew is required to _____ while continuing in AOP-017.

- A. cross-connect Station Air and Construction Air
- B. lower turbine load as necessary to maintain feed and steam flows matched
- C. trip the turbine and implement AOP-007, Turbine Trip below P-8,
- D. trip the reactor and Go to PATH-1

The correct answer is D.

A. Incorrect - AOP-017 does not direct cross-connecting station air and construction air. Construction air can be cross connection with station air, and it typically done so during an outage or when a large demand on station air is needed.

B. Incorrect - Although lowering turbine load may assist in matching steam flow and feed flow this is not a mitigation strategy specified in AOP-017. The correct strategy is specified in AOP-010.

C. Incorrect - AOP-017 directs that the reactor be tripped if S/G level is adversely affected by loss of IA if in Mode 1 or 2. Candidate may think that only a turbine trip is required since power is less than P-8 and a Turbine Trip would not result in a Reactor Trip.

D. Correct - Step of AOP-017, Attachment A, asks the operator to check any S/G level control "Adversely affected by loss of IA." This would be answered "YES." The next step would have the operator trip the reactor and go to PATH-1 and continue in AOP-017.

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Question 16

Tier/Group 1/1

K/A Importance Rating - RO 3.4 SRO 4.1

Ability to determine and interpret the following as they apply to the Loss of Instrument Air: When to commence plant shutdown if instrument air pressure is decreasing

Reference(s) - Sim/Plant design, PATH-1, AOP-017

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-017-004

Question Source - BANK (Last used for HLC-06 Replacement NRC Exam.)

Question Cognitive Level - F

10 CFR Part 55 Content - 43.5 / 45.13

Comments -

MAB Comments: IA pressure is 83 psig. Therefore, I am having difficulty understanding how MFR valves would be affected. Typically MFR valves will control at most plants at pressures much lower than 83 psig (maybe even down to 50 or 60 psig). **Lowered the IA pressure to 64 psig.**

Add "to" prior to the blank. **Added**

"C" is not plausible. Everything in the stem points to instrument air as being the problem (Instrument Air Alarms are annunciating). So if IA is the problem, taking manual control does not have much credibility. **Replaced "C" with "trip the turbine and implement AOP-007, Turbine Trip below P-8."**

Reformatted the question to separate the initial conditions and current conditions.

17. W/E 05 EK3.1 001

Given the following plant conditions:

- A loss of BOTH Main Feedwater Pumps (MFP) has resulted in a manual reactor trip.
- All 3 AFW Pumps are disabled.
- The crew is performing actions of FRP-H.1, Response to Loss of Secondary Heat Sink.
- Wide Range S/G levels are at 25% and lowering.
- Attempts to start either MFP have failed.
- PZR Level was maintained greater than 16%.

Which ONE (1) of the following completes the statement below?

IAW FRP-H.1, RCS pressure will be reduced by opening (1) to allow the (2).

A. (1) one PZR PORV

(2) Hi Steam Line DP and PZR Pressure SI signals to be blocked prior to performing actions to establish Condensate flow

B✓ (1) CVC-311, Aux. Spray

(2) Hi Steam Line DP and PZR Pressure SI signals to be blocked prior to performing actions to establish Condensate flow

C. (1) one PZR PORV

(2) safety injection flow to inject into the RCS

D. (1) CVC-311, Aux. Spray

(2) safety injection flow to inject into the RCS

The correct answer is B.

A. Incorrect. Opening one PZR PORV would be the correct answer if letdown had isolated. No information was given in the stem to indicate that PZR Level had lowered to the point at which letdown had isolated, so auxiliary spray would be utilized to lower pressure. The second part of the distractor is correct.

B. Incorrect - One PZR PORV would be used to reduce RCS pressure if letdown had been secured based on PZR level. Since letdown was in service then Auxiliary Spray will be the correct answer. One S/G will have to be depressurized to less than 600 psig to enable a condensate pump to flow forward into the S/G. The SI signals will be blocked to preclude having to reset the FW Isolation signals. Lowering RCS pressure will allow for more SI injection into the RCS, but this is not the basis for this step.

C. Incorrect - One PZR PORV would be used to reduce RCS pressure if letdown had been secured based on PZR level. Since letdown was in service then Auxiliary Spray will be the correct answer. The second part of the distractor is the basis for depressurizing the RCS when RCS Bleed and Feed is required. In this event Bleed and Feed criteria have not been met since S/G levels are at 25% Wide Range. The criteria for initiating Bleed and Feed is at least two S/G Wide Range levels less than 10% [19%].

D. Incorrect - Since letdown is in service then Auxiliary Spray is the correct method for lowering PZR pressure. The second part of the distractor is the basis for depressurizing the RCS when RCS Bleed and Feed is required. In this event Bleed and Feed criteria have not been met since S/G levels are at 25% Wide Range. The criteria for initiating Bleed and Feed is at least two S/G Wide Range levels less than 10% [19%].

Question 17

Tier/Group 1/1

K/A Importance Rating - RO 3.4 SRO 3.8

Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink): 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.

Reference(s) - Sim/Plant design, FRP-H.1, FRP-H.1BD

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-H.1-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 41.10 / 45.6 / 45.13

Comments -

MAB Comments: In a loss of heat sink scenario, how long would it take to get to 25% wide range SG levels – assuming EOC, long operating run, trip from full power? After this time has elapsed, what would pressurizer level likely be? Is 12% a reasonable pressurizer level for these circumstances? Is this situation operationally valid?

Depending on how quick the operator isolated the MSRs, it could take 15 to 20 minutes for S/G levels to lower to 25% wide range. Revised the question to remove the PZR level indication. Therefore, with PZR level in normal range Aux. Spray will now be the correct response.

18. W/E 12 EK3.3 001

Given the following plant conditions:

- A Reactor Trip and Safety Injection have occurred from 100% RTP.
- Following the Immediate Action Verifications of PATH-1, Breaker 52/2BL, Feed to MCC-9, trips.
- EPP-16, Uncontrolled Depressurization of All Steam Generators, is being performed.
- All steam generator (S/G) pressures are lowering uncontrollably.

Which ONE (1) of the following completes the statement below regarding the **preferred** method for controlling feedwater flow in accordance with EPP-16?

The basis for lowering flow to 80 to 90 gpm to all S/Gs is to (1) and the **preferred** method of controlling AFW flow is to (2).

- A. (1) minimize RCS repressurization rate
 - (2) dispatch an operator to manually throttle the V2-16s
- B. (1) maintain S/G components in "wet" condition
 - (2) dispatch an operator to manually throttle the V2-16s
- C. (1) minimize RCS repressurization rate
 - (2) throttle the MDAFW Flow Controllers FIC-1424 and FIC-1425
- D✓ (1) maintain S/G components in "wet" condition
 - (2) throttle the MDAFW Flow Controllers FIC-1424 and FIC-1425

The correct answer is D.

A. Incorrect. With a fault in one or two S/Gs the operators are directed in Foldout A to dump steam from the intact S/G to control RCS repressurization once the faulted S/Gs have dried out. Candidate may think that controlling the AFW flow to the S/Gs will have the same desired effect. Dispatching an operator to manually throttle the V2-16s is the RNO method for controlling flow. Typically this method is necessary due to the varying pressures in the S/G's. However, control of feedwater is preferred to remain in the control room.

B. Incorrect. The first part of the distractor is correct. Dispatching an operator to manually throttle the V2-16s is the RNO method for controlling flow. Typically this method is necessary due to the varying pressures in the S/G's. However, control of feedwater is preferred to remain in the control room.

C. Incorrect. With a fault in one or two S/Gs the operators are directed in Foldout A to dump steam from the intact S/G to control RCS repressurization once the faulted S/Gs have dried out. Candidate may think that controlling the AFW flow to the S/Gs will have the same desired effect. The second part of the distractor is correct.

D. Correct.

Question 18

Tier/Group 1/1

K/A Importance Rating - RO 3.5 SRO 3.7

Knowledge of the reasons for the following responses as they apply to the (Uncontrolled Depressurization of all Steam Generators): Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.

Reference(s) - Sim/Plant design, EPP-16, EPP-16BD

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-16-003

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 41.10 / 45.6 / 45.13

Comments -

MAB comments: Why would locally throttling AFW flow be plausible when nothing in the stem would cause an applicant to doubt control of AFW from the control room. Some complication needs to be added to the stem to make A(2) and B(2) plausible. There may be several ways to accomplish this – like failing a power supply that has no impact, but would add credibility.

Added "Following the Immediate Action Verifications of PATH-1, Breaker 52/2BL, Feed to MCC-9, trips" to the stem of the question. A loss of MCC-9 will affect several AFW MOVs, but not the flow control valves. As previously written this question had several misses during the validation. In simulator training very seldom can the flows be achieved to all S/Gs due to S/G pressure differences. This results in local cycling of the valves being required. This occurs so often that candidates often think that this is the preferred method of obtaining the desired flowrates.

19. 005 AK2.02 001

Given the following plant conditions:

- The plant is operating at 50% RTP with OST-011, Rod Cluster Control Exercise & Rod Position Indication, being performed.
- When Control Bank "D" rods are returned to 164 steps it is noted that one rod is 17 steps below the rest of the bank.
- AOP-001, Malfunction of Reactor Control System, is implemented by the crew.
- The Shift Manager has directed that the rod be realigned IAW AOP-001.

Which ONE (1) of the following completes the basic method used to realign the rod in accordance with AOP-001 listed below?

Open the Control Bank "D" lift coil disconnect switch(es) for (1).

Realign the rod using (2) position of the rod bank selector switch.

Close all lift coil disconnect switches.

A✓ (1) all but the misaligned rod

(2) CB D

B. (1) all but the misaligned rod

(2) M (MANUAL)

C. (1) the misaligned rod

(2) CB D

D. (1) the misaligned rod

(2) M (MANUAL)

The correct answer is A.

A. Correct.

B. Incorrect - The first part of the answer is correct. AOP-001 specifies that the rods will be moved by selecting the specific bank on the Rod Bank Selector switch. Since this is Control Bank D, leaving the Rod Bank Selector switch in Manual would not be a problem based on rod sequencing but is not authorized by the procedure.

C. Incorrect - The process for recovery is to withdraw the affected rod to align with the other rods in the bank. If only the misaligned rod lift coil disconnect switch was opened then all the unaffected rods would have to be inserted. This would create a much larger and undesired reactivity effect. The second part of the distractor is correct.

D. Incorrect - The process for recovery is to withdraw the affected rod to align with the other rods in the bank. If only the misaligned rod lift coil disconnect switch was opened then all the unaffected rods would have to be inserted. This would create a much larger and undesired reactivity effect. AOP-001 specifies that the rods will be moved by selecting the specific bank on the Rod Bank Selector switch. Since this is Control Bank D, leaving the Rod Bank Selector switch in Manual would not be a problem based on rod sequencing but is not authorized by the procedure.

Question 19

Tier/Group 1/2

K/A Importance Rating - RO 2.5 SRO 2.6

Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: Breakers, relays, disconnects, and control room switches

Reference(s) - Sim/Plant design, AOP-001, AOP-001BD

Proposed References to be provided to applicants during examination - None

Learning Objective -AOP-001-004

Question Source - BANK

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.7

Comments -

MAB Comment: Add to the question stem, "in accordance with AOP-001." **Added**

20. 028 AA2.04 001

Given the following plant conditions:

- Plant is at 100% RTP.
- "C" Charging Pump is in Auto and "B" Charging Pump is in Manual.
- Pressurizer level transmitter LT-459 is selected for control.
- The reference leg for LT-460 develops a leak.

Which ONE (1) of the following identifies the instrument and plant response?

	LI-460 PZR LVL <u>Indication</u>	"C" Charging Pump Speed Controller <u>Output</u>
A.	Lowers	Rises
B.	Rises	Lowers
C.	Lowers	Remains the same
D✓	Rises	Rises

The correct answer is D.

A. Incorrect - The reference leg leak will cause LI-460 to fail high. The indication would lower if the leak was on the variable line of the D/P cell. Due to the actual leak PZR level will lower as seen on LT-459. LT-459 lowering will result in the output of the speed control to "C" CCP to rise in order to maintain PZR level on the reference level.

B. Incorrect - The first part of the distractor is correct. Candidate confuse LT-460 level rise with a rise in the controlling channel. The candidate could also think that both LT-460 and LT-459 share a common reference leg. Both errors would result in the candidate selecting a lowering of the "C" CCP speed controller output.

C. Incorrect - The reference leg leak will cause LI-460 to fail high. The indication would lower if the leak was on the variable line of the D/P cell.

D. Correct - The reference leg leak will cause LI-460 to fail high. The actual leak will result in an actual reduction of PZR Level as seen on LT-459. This will result in a rise in "C" CCP speed controller output.

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Question 20

Tier/Group 1/2

K/A Importance Rating - RO 2.6 SRO 3.1

Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunctions: Ammeters and running indicators for CVCS charging pumps

Reference(s) - Sim/Plant design, System Description, GFES

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-025-004

Question Source - BANK (Modified from a question used on 2007 NRC Exam. Used VCT level in 2007 vice CCP Speed Controller Output.)

Question Cognitive Level - H

10 CFR Part 55 Content - 43.5 / 45.13

Comments - Discussion with P. Capehart on 6/15/11: RNP does not have ammeter indicators for CVCS charging pumps. It was agreed that any indications of CVCS charging pumps (speed indication, red/green lights, Flowrate, etc.) could be utilized to meet this K/A.

MAB Comments: Why are three columns of information provided in the answer choices? Generally good question writing practice would suggest that only the info needed to make 4 unique answer choices should be used. Suggest deleting the last column because it does not help to distinguish the answer choices. Because of this knowledge required by the KA is not needed to answer the question. I can answer the question with or without that third column just by knowing how the two level indicators respond. **Deleted the first column. Left the last column since this is more related to the KA.**

To try to fix the question, I would suggest breaking the reference leg on the LT that is **not** selected for control. Test how that LI responds with a broken reference leg and then test how the "C" charging pump speed controller responds. By doing this, the KA is met and the previous comment would also be addressed. **Revised as requested. Change the question to have the non-controller channel reference leg break.**

21. 032 AA2.09 001

I&C has just completed a surveillance on the high voltage power supply to Source Range nuclear instrument N-31. The surveillance determined the as-found voltage was 1400 VDC, instead of the normal 1600 VDC.

Which ONE (1) of the following identifies the effect the lower voltage has on SR N-31 instrument response?

N-31 will indicate (1) than normal due to a reduction in voltage to the (2).

- A. (1) higher
(2) pulse height discriminator
- B. (1) higher
(2) detector
- C. (1) lower
(2) pulse height discriminator
- D✓ (1) lower
(2) detector

The correct answer is D.

- A: Incorrect - Pulse height discriminator circuit has no relation to the High Voltage applied to the detector.
- B: Incorrect - Indicated power will lower. The reduction of 200 VDC is significant.
- C: Incorrect - Pulse height discriminator circuit has no relation to the High Voltage applied to the detector.
- D: Correct - The high voltage set at 1600 VDC in the Proportional Region of the detector curve, such that a significant reduction in applied voltage will result in a reduced count rate.

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Question 21

Tier/Group 1/2

K/A Importance Rating - RO 2.5 SRO 2.9

Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation: Effect of improper HV setting

Reference(s) - Sim/Plant design, LP-703, System Description, GFES

Proposed References to be provided to applicants during examination - None

Learning Objective - GFES Sensors and Detectors

Question Source - BANK (Last used for HLC-08. Format of question revised.)

Question Cognitive Level - H

10 CFR Part 55 Content - 43.5 / 45.13

Comments -

MAB Comments: Suggest deleting the extra words in the answer choices unless they are necessary to remain. I.E. A(2) pulse height discriminator; B(2) detector. **Removed extra words as recommended.**

Revised question to focus only on N-31 vice both source range instruments.
Validation comment.

22. 033 AG2.2.44 001

Given the following plant conditions:

- The plant is at 8% RTP with the Turbine at 1800 RPM, unloaded.
- The following is the current status of plant permissives:

REACTOR TRIP BLOCK P-7	POWER ABOVE P-6	POWER ABOVE P-10	LO POWER AUTO ROD WITHDRWL STOP
SOURCE RANGE TRIP BLOCKED	INTERM RANGE TRIP BLOCKED	LO POWER RANGE TRIP BLOCKED	STEAM DUMP T-AVG CONTROL BLOCKED
REACTOR TRIP BLOCK P-8	LO TEMP SAFETY INJECTION BLOCKED	LO PRESS SI BLOCK PERMIT	LO PRESS SAFETY INJECTION BLOCKED

(lightly shaded blocks are illuminated, darker blocks are extinguished)

- An operator assisting I&C with N-35 maintenance removes the N-35 control power fuses.

Which ONE (1) of the following identifies the Reactor Protection System response for the N-35 IR Level Trip Bypass switch positions shown below?

<u>NORMAL</u>	<u>BYPASS</u>
A. No Reactor Trip	No Reactor Trip
B. Reactor Trip	No Reactor Trip
C. No Reactor Trip	Reactor Trip
D✓ Reactor Trip	Reactor Trip

The correct answer is D.

A. Incorrect - Removing the control power fuse will trip the RPS bistable for the associated IR instrument. Placing the IR Level Trip Switch in Bypass will block an IR trip signal, but only if the channel has control power. Based on the current power level and status of the Intermediate Range Trip Blocked status light, the IR High Trip has not been blocked.

B. Incorrect - Removing the control power fuse will trip the RPS bistable for the associated IR instrument. Placing the IR Level Trip Switch in Bypass will block an IR trip signal, but only if the channel has control power. Based on the current power level and status of the Intermediate Range Trip Blocked status light, the IR High Trip has not been blocked.

C. Incorrect - Removing the control power fuse will trip the RPS bistable for the associated IR instrument. Placing the IR Level Trip Switch in Bypass will block an IR trip signal, but only if the channel has control power. Based on the current power level and status of the Intermediate Range Trip Blocked status light, the IR High Trip has not been blocked.

D. Correct.

Question 22

Tier/Group 1/2

K/A Importance Rating - RO 4.2 SRO 4.4

Loss of Intermediate Range Nuclear Instrumentation: 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.

Reference(s) - Sim/Plant design, System Description, OWP-011 (NI-7)

Proposed References to be provided to applicants during examination - None

Learning Objective - NIS SD-010-010

Question Source - BANK (Not used on an NRC Exam from 2004 to present.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 43.5 / 45.12

Comments -

23. 060 AK1.02 001

Given the following plant conditions:

- Plant is in Mode 3.
- R-14C, Main Vent Stack (Low Range Noble Gas), is inoperable.
- A leak on "C" Waste Gas Decay Tank has resulted in an R-20, Fuel Handling Building Lower Level - Low Range, alarm.
- IAW AOP-009, Accidental Gas Release From a WGDT, the HP has been directed to obtain air samples of the affected area and local evacuation completed.

Which ONE(1) of the following completes the statements below?

IAW AOP-009, HVE-5A (1) HVE-5B are required to be placed in service and (2) due to R-14C being inoperable.

A. (1) AND

(2) R-11/R-12 are required to be selected to the VENT Position

B✓ (1) OR

(2) R-11/R-12 are required to be selected to the VENT Position

C. (1) AND

(2) verify that R-14D, Main Vent Stack Mid Range, is operable

D. (1) OR

(2) verify that R-14D, Main Vent Stack Mid Range, is operable

The correct answer is B.

A. Incorrect - HVE -5A and HVE-5B cannot be run simultaneously due to interlocks. Candidate may think that it is desired to have both running to provide more filtered flow. The second part of distractor is correct.

B. Correct - AOP-009 requires that either HVE-5A OR -5B be placed in service. R-11/R-12 are aligned to the vent to ensure the gaseous release is monitored.

C. Incorrect - HVE -5A and HVE-5B cannot be run simultaneously due to interlocks. Candidate may think that it is desired to have both running to provide more filtered flow. R-14D is the Mid Range Accident monitor part of the R-14 Skid. Candidate may think that is acceptable to use the R-14D since higher reading will be expected with the accidental release in progress.

D. Incorrect - The first part of the distractor is correct. R-14D is the Mid Range Accident monitor part of the R-14 Skid. Candidate may think that is acceptable to use the R-14D since higher reading will be expected with the accidental release in progress.

Question 23

Tier/Group 1/2

K/A Importance Rating - RO 2.5 SRO 3.1

Knowledge of the operational implications of the following concepts as they apply to Accidental Gaseous Radwaste Release: Biological effects on humans of the various types of radiation, exposure levels that are acceptable for personnel in a nuclear reactor power plant; the units used for radiation intensity measurements and for radiation exposure levels

Reference(s) - Sim/Plant design, HPP-105, DOS-NGGC-0004, 10CFR20

Proposed References to be provided to applicants during examination - None

Learning Objective - MCD-12, PLANT ACCESS TRAINING

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.8 / 41.10 / 45.3

Comments -

Originally the question had the following in the stem.

Airborne radioactivity area if concentrations are such that an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of (1) percent of the Annual Limit on Intake.

The choices were 1 and 0.6, with 0.6 being the correct answer. All validators choice 1 as the answer.

MAB Comments: Why is all the peripheral information provided to start out the question? Delete all of the unnecessary information. Window dressing that has no material impact does not help match the KA. The only thing it does is add more for the applicant to read. In this question you are asking for parts of the definition of a DAC and an ALI. I do not think that only testing knowledge of those two definitions is testing the operational implications part of the KA. **Noted. Question revised to focus more on the operational implication of the accidental waste gas release.**

Suggestion: Any operational implication could be tested. This could include procedural actions based on exceeding an exposure limit, etc. You do not need to test every aspect of the list provided in the KA, but you do need to test the operational implications. **Tested knowledge of the operation of HVE-5A/B and requirements with R-14C inoperable coincident with an accidental waste gas release.**

24. 067 AA1.06 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- The following fire alarms (color of text) have been received on the Fire Alarm Computer.
 - A43 ZN-20 Fire Alm. TRN-A E1/E2 Room (RED)
 - A51 ZN-20 Fire Alm. TRN-A E1/E2 Rm. Halon Actuated (RED)
 - A55 ZN-NO Fire Alm. TRN-A FDAP A1 Master Fire Alm. (RED)
 - B04 ZN-20 Fire Alm. TRN-B E1/E2 Room (RED)
 - B06 ZN-20 Fire Alm. TRN-B E1/E2 Rm. Halon Actuated (RED)
 - B09 ZN-NO Fire Alm. TRN-B FDAP B1 Master Fire Alm. (RED)

Which ONE(1) of the following completes the statement below IAW AOP-041, Response to Fire Event?

The Control Room Operator is responsible for dispatching the fire brigade, starting the motor driven fire pump, placing the.....

- A✓ PCV-456 and PCV-455C Power Isolation Switches to the ISOLATED position and securing Auxiliary Building Ventilation. (Control Room Ventilation to remain in Normal Mode.)
- B. EDG and E1/E2 Breaker's Appendix R Isolation switches to NORMAL and securing Auxiliary Building Ventilation. (Control Room Ventilation to remain in Normal Mode.)
- C. PCV-456 and PCV-455C Power Isolation Switches to the ISOLATED position, securing Auxiliary Building Ventilation and placing Control Room Ventilation in Pressurization Mode.
- D. EDG and E1/E2 Breaker's Appendix R Isolation switches to NORMAL, securing Auxiliary Building Ventilation and placing Control Room Ventilation in Pressurization Mode.

The correct answer is A.

A. Correct.

B. Incorrect - The action to place the Diesel Gen. and E1/E2 Breaker's Appendix R Isolation switches to NORMAL is only applicable in AOP-004 when the control room must be evacuated. These are recently added switches that maintains normally open switch contacts to isolate fire-induced cable damage in the event of a postulated fire in the EDG rooms. Since the fire is in E1/E2 the candidate may think that they should be operated.

C. Incorrect - The first two actions are correct. The action to place control room ventilation in pressurization mode is incorrect. The candidate may think that this is prudent due to the proximity of the fire to the control room. This action is not directed in AOP-041.

D. Incorrect. See discussions in distractors B and C.

Question 24

Tier/Group 1/2

K/A Importance Rating - RO 3.5 SRO 3.7

Ability to operate and / or monitor the following as they apply to the Plant Fire on Site:
Fire alarm

Reference(s) - Sim/Plant design, AOP-041, APP-44, AOP-004

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-041-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.5 / 45.6

Comments -

MAB Comments:

"C" is not plausible. "A" is a subset of "C"; therefor, if "C" was correct, then "A" would also be correct. A guessing man would always choose the smaller of answers "A" and "C".

"D" is not plausible. "B" is a subset of "D".

Suggest adding words in parentheses to "A" and "B" stating that placing control room in pressurization mode is not required. This will address the subset issue. **Corrected as recommended.**

Question was rated as "E" due to the simplicity of the needed corrections, even though there were two distractors that were not plausible,

25. 076 AK2.01 001

Given the following plant conditions:

- Plant is currently at 100% RTP preparing for a shutdown due to high RCS Activity levels.
- A RCS leak of 10 gpm has been identified inside Containment.

Which ONE(1) of the following identifies which process radiation monitors will indicate an elevated reading?

R-11: Containment Air Particulate

R-12: Containment Air Gas

R-14C: Plant Stack Gas (Low range)

	<u>R-11</u>	<u>R-12</u>	<u>R-14C</u>
A.	Yes	Yes	Yes
B.✓	Yes	Yes	No
C.	No	Yes	Yes
D.	Yes	No	No

The correct answer is B.

A. Incorrect - R-14C is aligned to the stack. The CV is currently being sampled by R-11 and R-12. R-14C would indicate a rise in reading if leakage was into the Auxiliary Building.

B. Correct

C. Incorrect - The candidate would select this if only the Gas detectors responded to high activity RCS leakage and leakage was being released to the Auxiliary Building.

D. Incorrect - The candidate would select this if only the CV particulate detector responded to high activity RCS leakage.

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Question 25

Tier/Group 1/2

K/A Importance Rating - RO 2.6 SRO 3.0

Knowledge of the interrelations between the High Reactor Coolant Activity and the following: Process radiation monitors

Reference(s) - Sim/Plant design, System Description, AOP-005, OP-920

Proposed References to be provided to applicants during examination - None

Learning Objective - RMS006

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.7

Comments -

26. W/E 08 EG2.4.2 001

Given the following plant conditions:

- Plant was operating at 100% RTP when a steam line break occurs in the CV.
- All RCS Cold leg temperatures are right of Pressure - Temperature Limit "A".
- RCS pressure is 600 psig.

Which ONE(1) of the following completes the statement below?

The CSFST for CSF-4, RCS Integrity, states that entry requirements for FRP-P.1, Response to Imminent Pressurized Thermal Shock, RCS Cold Leg Temperature must have dropped **greater** than (1) in the last 60 minutes and RCS Cold Leg Temperature must be less than (2).

A. (1) 100°F

(2) 320°F

B✓ (1) 100°F

(2) 290°F

C. (1) 50°F

(2) 320°F

D. (1) 50°F

(2) 290°F

The correct answer is B.

A. Incorrect - The first part of the distractor is correct. The second part is the entry condition value for FRP-P.2.

B. Correct.

C. Incorrect - 50°F/hr is a common cooldown limit that is used in the EOP network. This rate is used in FRP-P.1 once the one hour soak is completed. The second part is the entry condition value for FRP-P.2.

D. Incorrect- 50°F/hr is a common cooldown limit that is used in the EOP network. This rate is used in FRP-P.1 once the one hour soak is completed. The second part of the distractor is correct.

Question 26

Tier/Group 1/2

K/A Importance Rating - RO 4.5 SRO 4.6

Pressurized Thermal Shock: Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.

Reference(s) - Sim/Plant design, CSFST, FRP-P.1

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-P.1-003

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7 / 45.7 / 45.8

Comments -

MAB Comments: Currently the question stem asks for what conditions will meet the entry conditions. This causes the two choices with 320F to not be plausible, because if 320F meets the criteria, then 290F will obviously also meet the criteria. This can be addressed by testing specifically what the procedure (Status Tree) states for P.1 entry criteria. I.E. The CSFST for CSF-4 states that

Change "To meet the entry conditions of..." to "The CSFST for CSF-4, RCS Integrity, states that entry requirements for..." as recommended.

27. W/E 10 EK3.1 001

Given the following plant conditions:

- The reactor has tripped due to a loss of off-site power.
- A RCS cooldown to Mode 5 must be performed.
- A Natural Circulation cooldown is in progress in accordance with EPP-5, Natural Circulation Cooldown.
- BOTH CRDM Cooling Fans, HVH-5A and 5B, are running.
- TSC has determined that the RCS cooldown rate must exceed the EPP-5 limit.

Which ONE (1) of the following completes the statement below?

Following procedure transition, the RCS cooldown rate is limited to (1) in order to (2) .

A✓ (1) 100°F/hr

(2) remain within the Technical Specification limits

B. (1) 50°F/hr

(2) remain within the Technical Specification limits

C. (1) 100°F/hr

(2) prevent formation of voids in the Reactor Vessel upper head region

D. (1) 50°F/hr

(2) prevent formation of voids in the Reactor Vessel upper head region

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The correct answer is A.

A. Correct.

B. Incorrect - The 50°F/hr cooldown limit is greater than 25°F/hr but the limit in EPP-6 and ITS is 100°F/hr. The 50°F/hr cooldown limit is used in other EOP procedures.

C. Incorrect - Cooldown rate of 25°F/hr is allowed in EPP-5 with both HVH-5A and B operating. When this rate is exceeded, transition to EPP-6 is required. ITS cooldown rate limit of 100°F/hr is correct. The purpose of EPP-6 is to continue plant cooldown and depressurization to cold shutdown under conditions that allow for the potential formation of a void in the upper head region.

D. Incorrect - Cooldown rate of 25°F/hr is allowed in EPP-5 with both HVH-5A and B operating. When this rate is exceeded, transition to EPP-6 is required. The 50°F/hr cooldown limit is used in other EOP procedures. The purpose of EPP-6 is to continue plant cooldown and depressurization to cold shutdown under conditions that allow for the potential formation of a void in the upper head region.

Question 27

Tier/Group 1/2

K/A Importance Rating - RO 3.4 SRO 3.7

Knowledge of the reasons for the following responses as they apply to the (Natural Circulation with Steam Void in Vessel with/without RVLIS): 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.

Reference(s) - Sim/Plant design, EPP-5/6, EPP-5/6BD

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-6-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 41.10 / 45.6 / 45.13

Comments -

28. 003 A1.07 001

Given the following plant conditions:

- Plant cooldown is in progress IAW GP-007, Plant Shutdown from Hot Shutdown to Cold Shutdown.
- RCS temperature and pressure is 250°F and 375 psig.
- "A" and "C" RCP seal leakoff flows indicate 0.7 gpm.
- Seal injection flows are normal.

RCS pressure control malfunction occurs and pressure begins to lower.

- Maximum RCP Seal Leakoff Temperature is 145°F.
- Maximum RCP Pump Bearing Temperature is 132°F.

Which ONE (1) of the following completes the statement below?

At (1) the crew is required to (2).

A. (1) 325 psig RCS pressure

(2) secure RCPs

B. (1) 325 psig RCS pressure

(2) open CVC-307, PRI SEAL BYP ISO

C✓ (1) 210 psid across the RCP #1 Seal

(2) secure RCPs

D. (1) 210 psid across the RCP #1 Seal

(2) open CVC-307, PRI SEAL BYP ISO

The correct answer is C.

A. Incorrect. 325 psig is the minimum pressure for starting a RCP, however, the RCP can continue to run as long as 210 psid is maintained on No. 1 Seal. With RCS pressure at 325 psig the No.1 Seal D/P would be approximately 300 psid.

B. Incorrect. 325 psig is the minimum pressure for starting a RCP, however, the RCP can continue to run as long as 210 psid is maintained on No. 1 Seal. With RCS pressure at 325 psig the No.1 Seal D/P would be approximately 300 psid. CVC-307 does not have to be opened unless RCP seal leakoff temperatures or RCP Pump Bearing temperatures are approaching their alarm setpoints. The given temperatures are normal for the given plant conditions. This is a recent change to the RCP Operating Procedure.

C. Correct.

D. Incorrect. CVC-307 does not have to be opened unless RCP seal leakoff temperatures or RCP Pump Bearing temperatures are approaching their alarm setpoints. The given temperatures are normal for the given plant conditions. This is a recent change to the RCP Operating Procedure.

Question 28

Tier/Group 2/1

K/A Importance Rating - RO 3.4 SRO 3.4

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: RCS temperature and pressure

Reference(s) - Sim/Plant design, OP-101, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective -RCS 004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 45.5

Comments -

MAB Comment: Appendix E of NUREG-1021 directs the applicants to not assume anything. The question directly contradicts the Appendix E direction by stating that they are required to assume. Is there a credible pressure control malfunction that results in a linear pressure decrease?

Suggestion: Discard the math and just test the values. This may also allow the stem to be simplified. Testing the values for when actions need to occur and then testing what those actions are will meet the KA. **Removed the math and simply asked for the parameter value necessary to take required action.**

29. 004 K5.30 001

Given the following plant conditions:

- The RCS is on RHR and solid.
- RCS pressure is 340 psig.
- PC-145, PRESSURE, in AUTO.
- HIC-142, PURIFICATION FLOW, controller setting is at 55% demand.

Subsequently,

- HIC-142 controller setting was adjusted to 50% demand.

Which ONE (1) of the following completes the statement below?

Steady-state to Steady-state, PC-145 **controller output** will (1) to restore letdown pressure to its original value and overall RCS pressure will (2).

A. (1) lower

(2) rise

B. (1) rise

(2) rise

C. (1) rise

(2) lower

D. (1) lower

(2) lower

The correct answer is B.

A Incorrect - PCV-145 is a reverse acting valve. The output on the controller will actually rise to close the valve. The candidate may think that since PCV-145 must be throttled closed due to closing HIC-142 that the controller output would lower. RCS pressure will rise due to mass flow out lowering while mass flow in has remained constant.

B Correct.

C Incorrect - The first part of the distractor is correct. The candidate may think that since letdown flow was lowered that overall system pressure would lower.

D Incorrect - PCV-145 is a reverse acting valve. The output on the controller will actually rise to close the valve. The candidate may think that since PCV-145 must be throttled closed due to closing HIC-142 that the controller output would lower. The candidate may think that since letdown flow was lowered that overall system pressure would lower.

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Question 29

Tier/Group 2/1

K/A Importance Rating - RO 3.8 SRO 4.2

Knowledge of the operational implications of the following concepts as they apply to the CVCS: Relationship between temperature and pressure in CVCS components during solid plant operation

Reference(s) - Sim/Plant design, System description, GP-007

Proposed References to be provided to applicants during examination - None

Learning Objective - CVCS 004

Question Source - BANK (Last used for the 2004 NRC Exam. Question format modified.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 45.7

Comments -

MAB Comment: Some supporting information was supplied with the question, but no justification for plausibility was written in the question analysis. The correct answer makes perfect sense to me, but I am struggling to see plausibility in the other answer choices. I placed a question mark on the question rating because no justification was supplied, so maybe there is something I am missing. Plausibility will need to be discussed to see if the question is acceptable.

Suggestion: Test controller manipulation or controller response. How does the operator adjust letdown pressure if being controlled in manual and how would the operator adjust temperature. **Revised the question to have the controller for HIC-142 adjusted from 55% to 50% output and test the knowledge of the impact on PCV-145 and RCS pressure from steady-state to steady-state.**

Suggestion: How does the plant respond to a failure of valves or controllers for the bypass around the RHR heatexchanger? Then how does the letdown controller respond (demand increases or decreases)?

30. 004 K6.14 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- "C" Charging Pump is currently running in AUTO and "B" Charging Pump is running in MANUAL at minimum speed.
- Maintenance has been completed on "A" Charging Pump and WCC has dispatched an operator to remove the clearance and align the pump for recirculation.
- During the valve alignments the operator incorrectly aligns the recirculation path by having **BOTH** CVC-277C, Charging Pump "A" Recirc Root, **AND** CVC-290, Charging Pump "A" To Charging Line, **OPEN**.

Which ONE(1) of the following completes the statement below, assuming no operator action?

The output on "C" Charging Pump speed controller will rise (1) and VCT level will (2) .

A. (1) and maintain PZR program level

(2) rise

B. (1) to maximum

(2) rise

C. (1) and maintain PZR program level

(2) remain the same

D. (1) to maximum

(2) remain the same

The correct answer is B.

A. Incorrect - The charging pump speed will rise to attempt to maintain PZR level, however, all the charging flow will be routed through the recirc line and PZR level will not be maintained. The VCT level will rise due to no change in letdown flow plus all the charging pump recirc flow entering the VCT through the seal return line.

B. Correct - All charging flow will be routed through the recirculation line and the AUTO charging pump speed controller will go to maximum due to lowering PZR level. Since all charging flow is through the recirculation line back into the VCT along with normal letdown flow, the VCT level will rise.

C. Incorrect - The charging pump speed will rise to attempt to maintain PZR level, however, all the charging flow will be routed through the recirc line and PZR level will not be maintained. The candidate may think that the recirc line ties back into the letdown line.

D. Incorrect - The first part of the distractor is correct. The candidate may think that the recirc line ties back into the letdown line.

Question 30

Tier/Group 2/1

K/A Importance Rating - RO 2.7 SRO 3.0

Knowledge of the effect of a loss or malfunction on the following CVCS components:
Recirculation path for charging pumps

Reference(s) - Sim/Plant design, CVCS System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - CVCS-009

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.7

Comments - K/A match because candidate is given a situation where the recirc path has been aligned to the VCT and a Charging Pump Discharge Valve is still open for an idle Charging Pump. The candidate must determine that all charging flow will be directed to the VCT causing PZR Level to lower and all charging flow will be lost to the regenerative heat exchanger causing the outlet temperature to rise.

Discussion with P. Capehart concerning K/A:

RNP's charging pump recirculation path is normally isolated and consists of manually operated valves. Agreed that it would be acceptable to write a question against operation of manual valve(s) or leakby and identify the impact on CVCS system.

Reviewed and approved by MAB.

31. 005 K3.01 001

Given the following plant conditions:

Initial Conditions

- Plant is in Mode 5 with the RCS depressurized.
- "A" RHR Pump is in-service.
- FC-605, RHR HX BYPASS FLOW, is in Manual with flow set at 3400 gpm.

Current Conditions

- APP-001-A7, RHR HX LO FLOW, is received.
- Observed that SI-863A, RHR Loop Recirc, valve indicates dual position.

Which ONE (1) of the following completes the statement below?

Based on the conditions above, RCS Temperature will (1) and RCS Level will (2).

A. ✓ (1) rise

(2) lower

B. (1) rise

(2) remain stable

C. (1) lower

(2) lower

D. (1) lower

(2) remain stable

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The correct answer is A

A. Correct - With SI-863A indicating dual (partially open) RHR HX outlet flow will be directed back to the RWST. This will result in a lowering RCS level due to a loss of inventory. The redirection of flow back to the RWST will result in a less RHR HX discharge reaching the core thus resulting in an RCS temperature rise. Actual RHR flow will lower since FC-605 is in manual.

B. Incorrect - The first part of the distractor is correct. The second part is plausible if the candidate thinks that SI-863A recircs back to the suction of the RHR pumps instead of the RWST. If this was the case then RCS level would remain stable.

C. Incorrect - Candidate may think that since there is more flow through the RHR HX that the RCS temperature will lower. Second part of distractor is correct.

D. Incorrect - Candidate may think that since there is more flow through the RHR HX that the RCS temperature will lower. The second part is plausible if the candidate thinks that SI-863A recircs back to the suction of the RHR pumps instead of the RWST. If this was the case then RCS level would remain stable.

Question 31

Tier/Group 2/1

K/A Importance Rating - RO 3.9 SRO 4.0

Knowledge of the effect that a loss or malfunction of the RHRS will have on the following: RCS

Reference(s) - Sim/Plant design, AOP-020, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - RHR 009

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.6

Comments -

MAB Comment: In the stem – how many RCPs have been secured? Would it be better to state that “all” RCPs have been secured? **Changed stem to Mode 5 with the RCS depressurized.**

Do procedures allow more than one RHR pump to be in operation? The stem states that the operating RHR pump trips. Does this leave open the possibility that an RHR pump is still operating? **Revised the question. Operating RHR Pump no longer trips.**

Delete all the extra unnecessary stuff in the answer choices – the only effect it has is to reduce plausibility. Just include the amount of information needed to make 4 unique answer choices. The answer choices should look something like:

- A. RCS pressure will rise; RCS temperature will rise
- B. RCS pressure will lower; RCS temperature will rise
- C. RCS pressure will rise; RCS temperature will lower
- D. RCS pressure will rise; RCS temperature will lower

Reformatted the answer choices to minimize the length of answers.

There may be an overlap issue with Q 29 (004K5.30). Knowledge from Q29 includes knowing that an increase in temperature will result in an increase in pressure during solid operating conditions. This question tests what will happen to RCS pressure when your cooling pump is tripped (I.E. temp increase). I understand the argument that the pump has tripped and this could impact pressure – but there still may be some overlap / double jeopardy issues. **Revised the question to remove the overlap issue.**

No explanation was provided to help me understand why a temperature decrease is plausible. Currently I do not see plausibility in temperature lowering when my cooling pump trips and stops moving coolant. Therefore, unless convinced otherwise, “C” and “D” are not plausible. **Question revise to improve plausibility of distractors.**

Revised format of question to separate the initial conditions and current conditions.

32. 006 K5.10 001

Which ONE (1) of the following identifies the reason for RCP restart IAW FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, if the SI termination criteria cannot be satisfied?

- A. Restores PZR spray to allow RCS depressurization in subsequent steps.
- B. Equalizes S/G pressures to allow simultaneous cooldown of all three loops in subsequent steps.
- C. Mixes Safety Injection water and RCS water to ensure adequate shutdown margin.
- D✓ Mixes Safety Injection water and RCS water to raise the fluid temperature entering the Reactor Vessel downcomer.

The correct answer is D.

A. Incorrect - Restoring RCPs will allow for restoration of PZR spray, however this is not the basis for starting the RCPs when SI termination criteria cannot be satisfied. PZR spray is utilized in FRP-P.1 to reduce RCS pressure.

B. Incorrect - Restoring Reactor coolant flow will equalize S/G pressure to an extent. However, further cooldown is not a mitigative strategy in FRP-P.1.

C. Incorrect - This distractor is similar to the basis for starting RCPs in FRP-C.1 with the exception of "to ensure adequate shutdown margin." Adequate shutdown margin is maintained by the fact that all rods have been inserted.

D. Correct.

Question 32

Tier/Group 2/1

K/A Importance Rating - RO 2.5 SRO 2.9

Knowledge of the operational implications of the following concepts as they apply to ECCS: Theory of thermal stress

Reference(s) - Sim/Plant design, FRP-P.1BD

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-P.1-003

Question Source - BANK (Not used on NRC Exam from 2004 to Present.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 45.7

Comments -

MAB comment: Do procedures ever allow terminating SI when termination criteria are not met? **NO** If so, then I will view "C" as plausible, if not, then "C" will not be plausible and will need to be modified or replaced. **Revised "C" to remove the implication of terminating SI when the criteria are NOT satisfied. Change "C" to imply that the RCPs are started to ensure proper mixing to ensure adequate shutdown margin is maintained.**

33. 007 A1.01 001

Which ONE(1) of the following completes the statements below?

The PRT high level alarm setpoint is (1).

The basis for this setpoint is to minimize the possibility of (2).

A. (1) 91%

(2) challenging the rupture discs following a 100% Load Rejection without a reactor trip

B. (1) 83%

(2) challenging the rupture discs following a 100% Load Rejection without a reactor trip

C. (1) 91%

(2) thermally shocking the pressurizer safeties and PORVs which could cause them to leak

D✓ (1) 83%

(2) thermally shocking the pressurizer safeties and PORVs which could cause them to leak

The correct answer is D.

A. Incorrect - 91% is the High PZR Level Reactor Trip setpoint. Candidate may think the higher level has reduced the PRTs ability to quench the steam if a Safety lifted. The safety valves are sized to handle the maximum surge rate resulting from a complete loss of load without reactor trip.

B. Incorrect - The first part of the distractor is correct. Candidate may think the higher level has reduced the PRTs ability to quench the steam if a Safety lifted. The safety valves are sized to handle the maximum surge rate resulting from a complete loss of load without reactor trip.

C. Incorrect - 91% is the High PZR Level Reactor Trip setpoint. The second part of the distractor is correct.

D. Correct

Question 33

Tier/Group 2/1

K/A Importance Rating - RO 2.9 SRO 3.1

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

Reference(s) - Sim/Plant design, OP-103, System Description, ITS Bases

Proposed References to be provided to applicants during examination - None

Learning Objective - PZR 004

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.5 / 45.5

Comments -

MAB Comment: Why is all the stuff at the beginning of the question provided? What importance or function does it have? Would this be the same question if it started with Which ONE (1) of the following? **Revised the question to simply ask for the setpoint and basis.**

Considering the above comment, is this a (F)undamental LOK vs. a (H)igher LOK? It seems like the applicant just needs to recognize the setpoint and know the basis, which would be a lower cognitive question. **Changed cognitive level to an F.**

34. 007 K3.01 001

Given the following plant conditions:

- The plant had been operating at 100% RTP when a Reactor Trip and Safety Injection occurred due to a faulted steam line outside containment.
- While performing PATH-1 actions the following indications were observed:
 - APP-003-D3, PRT HI/LO LEVEL
 - APP-003-C3, PRT HI PRESS, alarmed and cleared
 - R-2, CV Low Range Monitor - Stable
 - CV Sump Level - Rising

Which ONE(1) of the following identifies the cause of the indications given?

- A✓ SI-857B, Loop "B" Cold Leg Inj Relief to PRT, failed open
- B. Reactor Vessel Head inner o-ring fails
- C. PZR Safety Valve failed open
- D. "A" RCP #2 seal failure

The correct answer is A.

A. Correct -

B. Incorrect - This failure would give you the CV indications if the outer o-ring had also failed. Would not give you the PRT indications. The inner o-ring leakage goes to the RCDT.

C. Incorrect - A Safety Valve failing open resulting a the PRT Rupture disc failing would result in R-2 indications rising. All other indications would be expected.

D. Incorrect - A failure of #2 seal would give you indications of a rising level in the RCDT, but not the PRT.

Question 34

Tier/Group 2/1

K/A Importance Rating - RO 3.3 SRO 3.6

Knowledge of the effect that a loss or malfunction of the PRTS will have on the following: Containment

Reference(s) - Sim/Plant design, APP-003-D3, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - PZR 007

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.6

Comments -

MAB Comment: Analysis of answer choice "A": What would PRT pressure do if CL Inj RV failed open? Your analysis states that the high PRT pressure alarm will not come in – is this true? **The high PRT pressure alarm would only come in if it filled the PRT.**

None of the second set of conditions is needed for this question. Delete all of it unless there is a reason that it needs to stay. Remember that adding unnecessary information does not help match a KA, etc. If it is not needed to answer the question, then it has no impact on the KA match. **Regrouped the information in the Stem of question and removed unnecessary information.**

Modification Idea: I would consider deleting the PRT Hi Temp alarm to make the source the CL inj RV and test whether sump level will go up and whether R-2 will rise.

Revised as recommended.

Are there any differences in indications between a PORV failing open and a Safety Valve failing open? **A Safety Valve failing open would result in immediate receipt of Accoustic Monitoring Alarms. All other indications would be identical.**

The question states, "assuming no operator action." Appendix E disallows assumptions. Simply state that no operator actions have taken place, rather than telling the applicants to make an assumption. I would suggest doing a word search on the entire exam and try to remove the word assume wherever possible. There is no harm in stating that no operator actions have occurred, but this is also part of the rules for taking the test as stated in Appendix E. **Removed the "assuming no operator action" statement.**

35. 008 G2.4.50 001

Given the following plant conditions:

- Unit has experienced a LBLOCA.
- EPP-10, Transfer to Long Term Recirculation, has been implemented.
- APP-002-E5, SI PMP COOL WTR LO FLOW, is received.

Which ONE(1) of the following completes the statements below IAW APP-002-E5?

The SI Pump Cooling Water Low Flow alarm setpoint is (1) GPM.

APP-002-E5 requires the operator to (2) .

A. (1) 100

(2) continue operation of the SI Pump

B. (1) 50

(2) continue operation of the SI Pump

C. (1) 100

(2) stop the SI Pump immediately

D✓ (1) 50

(2) stop the SI Pump immediately

The correct answer is D

A. Incorrect - APP-002-E5 states "If SI Pumps are operating under non-emergency conditions OR long term recirculation, THEN STOP the pumps." The candidate may not remember the exact wording in the APP and think that since they are still in the EOP network that running the pump with a cooling water low flow alarm is prudent. The setpoint for FIC-658, CCW SI Pump Flow Indicator, is 50 GPM and the 100 GPM is the setpoint for the RCP thermal barrier high flow. Also, 100 gpm is the low flow setpoint for CCW to CRDM LO FLOW.

B. Incorrect - See discussion in A above.

C. Incorrect - The setpoint for FIC-658 , CCW SI Pump Flow Indicator, is 50 GPM and the 100 GPM is the setpoint for the RCP thermal barrier high flow. Also, 100 gpm is the low flow setpoint for CCW to CRDM LO FLOW. The second part of the distractor is correct.

D. Correct

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Question 35

Tier/Group 2/1

K/A Importance Rating - RO 4.2 SRO 4.0

Component Cooling Water System (CCWS): Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Reference(s) - Sim/Plant design, APP-002-E5, System Description, APP-001, OST-155

Proposed References to be provided to applicants during examination - None

Learning Objective - SI SD-002-009

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.3

Comments -

MAB Comment: Test what the operator is “required” to do – not what he will do. Do a search of the entire exam (I know the word will appears elsewhere). Change the second part of the question prefix to: APP-002-E5 requires the operator to _____. **Revised as recommended.**

Make similar changes throughout the exam. We must test what operators are required to do because who knows what they will do. **Noted.**

Distractors A(2) and B(2) are not plausible. From a common sense perspective, a safety related pump has no cooling during a surveillance test (non-emergency), so it only makes sense to protect that pump by stopping it. There is not much plausibility here. **Changed the stem of the question to have the pump operating on long term recirculation following a LOCA. The action in the APP still directs that the pump be stopped immediately, but it does improve the plausibility of continuing to run the pump since still in the EOP network.**

36. 010 K1.03 001

Given the following plant conditions:

- The plant is in Mode 1 at 100% RTP
- The Pressurizer Pressure Controller, PC-444J, is in AUTOMATIC

Which ONE (1) of the following identifies how RCS pressure and PC-444J Controller output will respond if the controller potentiometer setpoint is lowered from 6.7 to 6.4 ?

	<u>RCS Pressure</u>	<u>Controller Output (Demand)</u>
A.	Rise	Rise
B.	Rise	Lower
C✓	Lower	Rise
D.	Lower	Lower

The correct answer is C.

A. Incorrect - Lowering the setpoint will cause the controller to maintain pressure in a lower pressure band. Therefore pressure will lower. RNP does have controllers that are reverse acting such as the S/G PORV controllers. The second part of the distractor is correct for the given conditions.

B. Incorrect - Lowering the setpoint will cause the controller to maintain pressure in a lower pressure band. Therefore pressure will lower. RNP does have controllers that are reverse acting such as the S/G PORV controllers. The second part of the distractor is correct for a rise in RCS pressure.

C. Correct.

D. Incorrect - The first part of the distractor is correct. PC-444J output signal rises to lower the pressure to the new setpoint.

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Question 36

Tier/Group 2/1

K/A Importance Rating - RO 3.6 SRO 3.7

Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the following systems: RCS

Reference(s) - Sim/Plant design, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - PZR 007

Question Source - BANK (Not used on NRC Exam from 2004 to Present.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.2 to 41.9 / 45.7 to 45.8

Comments -

37. 010 K4.01 001

Which ONE(1) of the following completes the statement below?

A design feature of the Pressurizer maintains a small amount of flow in the spray lines in order to

- A. reduce the potential for water hammer upon spray initiation.
- B. maintain a small differential across the spray valves.
- C. maintain a constant firing rate to the Control Group heaters.
- D✓ reduce thermal stresses in the spray piping and auxiliary spray connection.

The correct answer is D.

A. Incorrect - The small amount of flow in the spray lines may assist in minimizing the potential for water hammer, however, a slight water hammer or pressure surge in the spray line occurs when initiating spray flow. The design concern is for reducing thermal stresses in the spray piping and auxiliary spray connection by maintaining a small amount of flow at all times.

B. Incorrect - Although this flow does minimize the D/P across the spray valves this is not the reason for maintaining a continuous flow.

C. Incorrect- A constant flow to the pressurizer could "theoretically" be established to maintain a constant firing rate. This flow rate is not known nor attempted to be established.

D. Correct - Exert from PZR System Description: A small continuous spray flow is provided, by means of the throttle valves (needle valves) which bypass the spray valves, to help ensure that the PZR liquid is in chemical equilibrium with the rest of the reactor coolant system (RCS) **and to prevent thermal shock of the spray piping and the auxiliary spray connection.**

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Question 37

Tier/Group 2/1

K/A Importance Rating - RO 2.7 SRO 2.9

Knowledge of PZR PCS design feature(s) and/or interlock(s) which provide for the following: Spray valve warm-up

Reference(s) - Sim/Plant design, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - PZR 004

Question Source - BANK (Not used on an NRC Exam from 2004 to present.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7

Comments -

MAB Comment: Is "A" arguably correct? Will water continually pass through the spray nozzle? Could the nozzle be considered full? How is full defined for the spray nozzle? We need to ensure that "A" is not a correct answer choice. If needed, it will be replaced. We can discuss if you have the documentation that supports it as being incorrect. I have concerns because the mechanism for reducing thermal stresses is to have a continuous stream of water. Are we then testing the definition of what a full spray nozzle is to differentiate between "A" and "D"?

Revised "A" from "maintain PZR spray nozzle full of subcooling water" to "reduce the potential for water hammer upon spray initiation."

38. 012 A3.05 001

Given the following plant conditions:

- Unit at 30% RTP
- Power Range channel N-43 has been removed from service IAW OWP-011 to support drawer calibration.

Subsequently:

- Inverter A trips

What impact will the failure have on the Reactor Protection System?

- A✓ Reactor will trip from Power Range High Flux (HIGH) setpoint.
- B. Reactor will trip from Power Range High Flux (LOW) setpoint.
- C. Reactor will trip from Intermediate Range High Flux trip.
- D. Reactor will NOT trip.

The correct answer is A

A. Correct

B. Incorrect - With N-43 being removed from service IAW OWP-011, the bistables for Overtemperature Delta T, Overpower Delta T and Power Range High Flux (HIGH) setpoint have been manually tripped. The bistable for Power Range High Flux (LOW) setpoint is NOT tripped due to power being above the P-10 permissive setpoint (10%). With the failure of Inverter A, Instrument Busses 2 and 7A/7B will be de-energized and result in all of the bistables associated with Channel 2 tripping from the loss of power, thus the reactor will trip from the N-42 and N-43 high flux trip (HIGH) bistables being tripped.

C. Incorrect - See discussion above. A loss of Inverter "A" will result in a loss in IB 2 and 7A/7B. This loss will result in a loss of NI-36 (IRNI). At the given power levels the IR High Flux Trip has been bypassed.

D. Incorrect - Although N-43 is bypassed the bistables for its associated trips are inserted when removing it from service. This changes the PRNI coincidence from 2 of 4 to 1 of 3. Therefore, the reactor will trip on a loss of Inverter "A" and IBs 2 and 7A/B.

Question 38

Tier/Group 2/1

K/A Importance Rating - RO 3.6 SRO 3.7

Ability to monitor automatic operation of the RPS, including: Single and multiple channel trip indicators

Reference(s) - Sim/Plant design, System Description, OWP-011

Proposed References to be provided to applicants during examination - None

Learning Objective - RPS 006

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.5

Comments -

MAB Comment: "C" and "D" not plausible because they are not mutually exclusive answer choices. Knowing that there cannot be two correct answers makes these two choice not plausible.: How are "C" and "D" different? N-42 is bypassed for both answer choices and power is above P-10 for both answer choices. N-42 being bypassed would play into both answer choices, thereby creating a subset issue. These two answer choices are not mutually exclusive. Suggest making "D" simply: "Reactor will not trip." Then replace "C" to another credible mechanism that could trip the reactor. **Revised "C" from "NOT trip due to power being >P-10 permissive" to "trip from Intermediate Range High Flux trip." Change stem of question to raise power to 30%, N-43 vice N-42 is removed from service and Inverter A trips. This was necessary for plausibility of "C".**

39. 013 K2.01 001

Which ONE (1) of the following identifies the power supply to the ESFAS interposing relays?

	<u>Train "A"</u>	<u>Train "B"</u>
A✓	IB-7A	IB-3
B.	IB-6	IB-9
C.	IB-2	IB-8
D.	IB-1	IB-4

The correct answer is A.

A. Correct.

B. Incorrect. Instrument Buses 6 and 9 are powered from MCC-5 and MCC-6, respectively. This would equate to a separation of trains similar to Instrument Buses 7A and 3 which are powered from MCC-A and MCC-B, respectively.

C. Incorrect. These selections are instrument busses that are supplied via MCC-A and MCC-B similar to the correct answers.

D. Incorrect. Instrument Buses 1 and 4 are powered from MCC-5 and MCC-6, respectively. This would equate to a separation of trains similar to Instrument Buses 7A and 3 which are powered from MCC-A and MCC-B, respectively.

Question 39

Tier/Group 2/1

K/A Importance Rating - RO 3.6 SRO 3.8

Knowledge of bus power supplies to the following: ESFAS/safeguards equipment control

Reference(s) - Sim/Plant design, System Description.

Proposed References to be provided to applicants during examination - None

Learning Objective - ESF 003

Question Source - BANK (Not used on an NRC Exam from 2004 to present.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7

Comments -

40. 022 A3.01 001

A Large Break LOCA concurrent with a loss of the Startup Transformer has occurred.

- Train "A" Engineered Safeguards Sequencer did NOT automatically actuate.
- Both "A" and "B" CV Spray Pumps tripped.

Which ONE (1) of the following completes the statement below?

The **MINIMUM** action required to ensure containment pressure remains below its design limit is to verify (1) automatically started **AND** manually start (2) and ensure all associated cooling water outlet low flow alarms are clear.

- A. (1) HVH-3 OR HVH-4
(2) HVH-1 OR HVH-2
- B✓ (1) HVH-3 AND HVH-4
(2) HVH-1 AND HVH-2
- C. (1) HVH-1 OR HVH-2
(2) HVH-3 OR HVH-4
- D. (1) HVH-1 AND HVH-2
(2) HVH-3 AND HVH-4

The correct answer is B.

A. Incorrect. With no CV Spray pumps operating, all four CV HVH units are required to maintain CV design pressure.

B. Correct.

C. Incorrect. Trains are swapped. With no CV Spray pumps operating, all four CV HVH units are required to maintain CV design pressure.

D. Incorrect. Trains are swapped. Train "B" components need to be verified running and Train "A" components must be manually started.

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Question 40

Tier/Group 2/1

K/A Importance Rating - RO 4.1 SRO 4.3

Ability to monitor automatic operation of the CCS, including: Initiation of safeguards mode of operation

Reference(s) - Sim/Plant design, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - ESF 007

Question Source - BANK (Last used on 2004 NRC Exam. Question format modified.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.5

Comments -

41. 022 A4.05 001

Given the following plant conditions:

- It is July 31 and the plant is at 100% RTP.
- Containment temperatures have been slowly approaching the ITS limit.
- ERFIS has just failed.

Which ONE(1) of the following identifies the **correct order of preference** for obtaining the "**official**" Containment Temperature IAW PLP-118, Hot Weather Operations?

1. RTGB Edge meter
2. Make a containment entry to obtain temperature readings.
3. Perform SPP-035, Containment Bulk Average Temperature Measurement

A. 1, 2, 3

B. 1, 3, 2

C. 2, 1, 3

D. 3, 1, 2

The correct answer is D.

A. Incorrect - RNP has very limited containment temperature instrumentation. These temperature instruments are located in the RCP Pump Bays and on the CV Operating Deck. These do not provide a representative indication of the Bulk CV Temperature. SPP-035 uses temperature resistance readings from the five CV temperature probes and processes the information through MathCad program to compute a Bulk Weighted CV Temperature.

B. Incorrect - See discussion in "A"

C. Incorrect - See discussion in "A". A containment entry to obtain temperatures would be a last resort based on personnel safety implications.

D. Correct.

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Question 41

Tier/Group 2/1

K/A Importance Rating - RO 3.8 SRO 3.8

Ability to manually operate and/or monitor in the control room: Containment readings of temperature, pressure, and humidity system

Reference(s) - Sim/Plant design, PLP-118, SPP-035

Proposed References to be provided to applicants during examination - None

Learning Objective - CVHVAC 007

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7 / 45.5 to 45.8

Comments -

42. 026 K1.01 001

Given the following plant conditions:

- A Large Break LOCA and Loss of Offsite Power have occurred.
- EDG B tripped while starting.
- RWST is at 9% level.
- Alignment to the CV Sump has been completed.
- CV Pressure is currently 12 psig.

Which ONE (1) of the following completes the statement below?

SI-844A and B, CV Spray Pump Suction Isolation Valves, will be (1) and RHR Pump A is capable of supplying suction to CV Spray Pump(s) (2).

A. (1) closed

(2) "A" ONLY

B. (1) closed

(2) "A" and "B"

C. (1) open

(2) "A" ONLY

D. (1) open

(2) "A" and "B"

Answer is D

A. Incorrect - SI-844A/B are normally open valves and are not impacted by the loss of E2. SI-844A/B are not cycled prior to or during alignment for piggy-back mode of operation. Without power to "B" train components only "A" CV Spray Pump will be operable. Also, Attachment 1 of EPP-9 closes RHR Pump Suction Valves RHR-752A/B prior to initiating cold leg recirculation. The candidate could confuse this with having to close SI-844s. The candidate may think that RHR Pump "A" can not be aligned to supply suction to both trains of spray with only E-2 available.

B. Incorrect - SI-844A/B are normally open valves and are not impacted by the loss of E2. SI-844A/B are not cycled prior to or during alignment for piggy-back mode of operation. The second part of the distractor is correct.

C. Incorrect - The first part of the distractor is correct. The candidate may think that RHR Pump "A" can not be aligned to supply suction to both trains of spray with only E-2 available.

D. Correct - SI-844A/B are not cycled prior to or during alignment for piggy-back mode of operation. RHR Pump "A" can still be aligned to supply suction pressure to both "A" and "B" CV Spray Pump.

Question 42

Tier/Group 2/1

K/A Importance Rating - RO 4.2 SRO 4.2

Knowledge of the physical connections and/or cause-effect relationships between the CSS and the following systems: ECCS

Reference(s) - Sim/Plant design, System Description, EPP-9

Proposed References to be provided to applicants during examination - None

Learning Objective - CSS SD-024-009

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.2 to 41.9 / 45.7 to 45.8

Comments -

MAB Comment: The second part of the answer choices are confusing. It appears that the "A" RHR pump will in fact supply suction to allow operation of both spray pumps. It is true that the "B" spray pump does not have power, but its operation is not disallowed due to the RHR supply. It also strikes me as strange to see "operation" underlined here. Seeing that underlined may, in fact, validate my comment here in that the RHR supply has no impact on the operation of the Spray Pump. This ambiguity could lend itself to more than one correct answer because the RHR supply does allow operation of both spray pumps.

This question appears to test two knowledge items: (1) the power supply to the "B" Spray Pump, and (2) the position of SI-844A&B.

Revised the second part of the question from "RHR Pump A will supply suction to allow operation of CV Spray Pump(s)" to "RHR Pump A is capable of supplying suction to CV Spray Pump(s)". This changes the focus of the question to how the loss of power impacts the ability to align the ECCS system with CSS.

43. 026 K3.02 001

Given the following plant conditions:

- The plant had been operating at 100% RTP when a Large Break LOCA occurred.
- A malfunction in the CV Spray System results in FI-949, Spray Additive Flow, indicating higher than actual flow.
- The crew has transitioned to "Piggy-Back" Mode IAW EPP-9, Transfer to Cold Leg Recirculation, with CV Pressure at 14 psig.
- Spray Additive Tank level is currently 60%.

Which ONE(1) of the following completes the statement below?

The resultant operational implication of FI-949 failure is that during cold leg recirculation ECCS components will be more susceptible to (1) and IAW EPP-9 the required CV Sump pH is (2).

A✓ (1) chloride stress corrosion

(2) 8.5 - 10.5

B. (1) chloride stress corrosion

(2) greater than 10.5

C. (1) gas binding

(2) greater than 10.5

D. (1) gas binding

(2) 8.5 - 10.5

The correct answer is A.

A. Correct - Since the indicated flow is higher than actual flow then less than expected NaOH will have been delivered to the sump, therefore the pH will be less than expected. The expected CV Sump pH is 8.5 - 10.5.

B. Incorrect - The first part of the distractor is correct. 10.5 is the upper range of the desired pH. Candidate may incorrectly think that it is desired to have highly caustic sump water.

C. Incorrect - Gas intrusion is a recent industry concern for ECCS components and piping. Candidate may this is the concern. 10.5 is the upper range of the desired pH. Candidate may incorrectly think that it is desired to have highly caustic sump water.

D. Incorrect - Gas intrusion is a recent industry concern for ECCS components and piping. Candidate may this is the concern. The second distractor is correct.

Exert from EPP-9

Determine CV Sump pH As Follows

a. Request Chemistry Personnel obtain an RHR sample, while continuing with this procedure

b. Check RHR Sample Results - AVAILABLE

*c. Check RHR pH - **GREATER THAN 8.5***

Exert from EPP-9BD

This step is necessary to check CV Sump pH for long term corrosion control per Westinghouse NSAL 93-016. This letter describes the long term corrosion control concerns if a SBLOCA occurs which does not result in a Spray Actuation. Provisions are made to raise sump pH using Attachment 3 if pH is low. pH is not expected to become excessively high. If SAT levels and concentrations are maintained correctly pH should remain **below the limit of 10.5**. At this point the CV has been isolated and IVSW initiated. It may not be possible to inject pH reducing agents to the CV until after radiation levels have decayed.

ILC-11-2 NRC Exam

Question 43

Tier/Group 2/1

K/A Importance Rating - RO 4.2 SRO 4.3

Knowledge of the effect that a loss or malfunction of the CSS will have on the following:
Recirculation spray system

Reference(s) - Sim/Plant design, System Description, EPP-9BD (Step 48)

Proposed References to be provided to applicants during examination - None

Learning Objective - CSS SD-024-009

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.6

Comments - Discussion with P. Capehart on 6/15/11: Clarified that "recirculation spray system" is equivalent to CV spray operation while in long-term recirculation (piggy-back) mode of operation.

MAB Comment: RCS water is always acidic. PWRs use boric acid as one of the two primary means of reactivity control that are available to licensed operators. So when faced with a situation where chemicals cannot be added due to the Add Tank Outlet failing closed, why would an operator believe that the sump water would be caustic? If Robinson also uses TSP baskets in the sump or something like that, then there may be some plausibility for the water to be caustic. **Revised the question to ask resultant pH if NaOH flow is indicating higher than actual and the required CV Sump pH.**

I also struggle in seeing plausibility in the gas binding. **Revised question to remove this portion of question.**

44. 039 K4.06 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- Steam line break occurs on Steam Line A just outside the CV wall.
- MSIV "A" fails to close when demanded.

Which ONE (1) of the following identifies the design feature that will ensure that all of the S/Gs do NOT blowdown through the faulted steam line?

- A. MSIV auto closure on High Steam Line Flow with Low Tave signal.
- B. MSIV auto closure on High Steam Line Delta P signal.
- C✓ Check valves downstream of each MSIV.
- D. Check valves upstream of each MSIV.

Answer is C

A. Incorrect - Check valves are installed on the downstream side of each of the MSIVs. These serve to ensure that back flow is prevented when a faulted steam line occurs on one steam line. MSIV auto closure signal does exist when 2 out of 3 steam lines have a high steam line flow signal, coincident with a Low Tave or Low Steam Line pressure, which provides protection for a steam break downstream of the MSIVs.

B. Incorrect - High Steam Line Delta P signal will provide a Safety Injection signal for 1 faulted S/G but does not provide any signal for closure of the MSIVs.

C. Correct

D. Incorrect - The check valve design feature is correct but the location within the system is incorrect.

Question 44

Tier/Group 2/1

K/A Importance Rating - RO 3.3 SRO 3.6

Knowledge of MRSS design feature(s) and/or interlock(s) which provide for the following: Prevent reverse steam flow on steam line break

Reference(s) - Sim/Plant design, System Description, ITS 3.3.2 Bases

Proposed References to be provided to applicants during examination - None

Learning Objective -MSS 004

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7

Comments -

45. 059 A2.04 001

Given the following plant conditions:

- Plant is operating in Mode 1 at 100% RTP.
- A Reactor Trip and Safety Injection has occurred.
- No AFW pumps are available.
- RCS Bleed-and-Feed is in progress IAW FRP-H.1, Response to Loss of Secondary Heat Sink.
- Both Condensate Pumps are running.

Which ONE (1) of the following completes the statement below?

To restore feed flow to the S/G(s) IAW FRP-H.1, the operator is required to place (1) Feedwater Isolation Key Switch(es) in the OVRD/RESET position, verify the Feedwater Header Section Valves (2) and start 1 Main Feedwater Pump to feed (2) S/G(s).

A. (1) ONE

(2) OPEN

(3) ONE

B. (1) THREE

(2) OPEN

(3) ONE

C. (1) ONE

(2) CLOSED

(3) ALL

D✓ (1) THREE

(2) CLOSED

(3) ALL

The correct answer is D.

A. Incorrect - Reference: FRP-H.1 Pages 1 through 11. All key operated override switches are placed in OVRD/RESET Position. All must be in OVRD/RESET and the Feedwater Header Section Valves must be closed to allow for starting of the MFP. 1 MFP started and FRV Bypass opened. Candidate may think that only one Feedwater Isolation Key Switch is utilized to over-ride all Feedwater Isolation signals similar to other over-ride switches on the RTGB. The Feedwater Header Section Valves must be closed to allow for starting of the MFP. All S/Gs are fed once feedwater flow is established.

B. Incorrect - The first part of the distractor is correct. The Feedwater Header Section Valves must be closed to allow for starting of the MFP. All S/Gs are fed once feedwater flow is established.

C. Incorrect - All key operated override switches are placed in OVRD/RESET Position. All must be in OVRD/RESET and the Feedwater Header Section Valves must be closed to allow for starting of the MFP. 1 MFP started and FRV Bypass opened. Candidate may think that only one Feedwater Isolation Key Switch is utilized to over-ride all Feedwater Isolation signals similar to other over-ride switches on the RTGB. The second and third part of the distractor are correct.

D. Correct.

ILC-11-2 NRC Exam

Question 45

Tier/Group 2 / 1

K/A Importance Rating - RO 2.9 SRO 3.4

Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Feeding a dry S/G

Reference(s) - Sim/Plant design, FRP-H.1

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-H.1-004

Question Source - ILC-09 NRC EXAM Modified

Question Cognitive Level - F

10 CFR Part 55 Content - 41.5 / 43.5 / 45.3 / 45.13

Comments - K/A match because candidate is given a situation where a plant trip occurred with a loss of secondary heat sink. Bleed and Feed was required due to S/G levels being low. The candidate must know how to manipulate the Feedwater Isolation Switches to start a MFP and the flowpath that will be used to restore S/G levels.

ILC-09 NRC EXAM Modification:

ILC-09 question had the candidate determine if the S/Gs would be fed via the FRV or the FRV Bypass Valve. This question has been modified to have the candidate determine the required position of the Feedwater Header Section Valves. Also, the question has been reformatted to a fill-in the blank.

Reviewed and approved by MAB.

46. 059 A3.02 001

Which ONE (1) of the following completes the statement below?

At 15% RTP the programmed S/G level is approximately (1) and at 20% RTP the programmed S/G level is approximately (2).

A. (1) 52%

(2) 52%

B✓ (1) 49%

(2) 52%

C. (1) 39%

(2) 39%

D. (1) 29%

(2) 39%

The correct answer is B.

A. Incorrect. 52% is the programmed level from 20% to 100% RTP.

B. Correct. The programmed levels are 39% to 52% from 0 to 20% power and a constant 52% from 20% to 100% power.

C. Incorrect. If the candidate incorrectly thinks that S/G levels are programmed at 39% level from 0 to 20% power and ramped from 39% to 52% from 20% to 100% power this answer would be correct. The numbers are correct, just misapplied.

D. Incorrect. This value would be correct if programmed level was from 0 to 39% from 0 to 20% RTP.

ILC-11-2 NRC Exam

Question 46

Tier/Group 2/1

K/A Importance Rating - RO 2.9 SRO 3.1

Ability to monitor automatic operation of the MFW, including: Programmed levels of the S/G

Reference(s) - Sim/Plant design, System Description, Logic Diagrams

Proposed References to be provided to applicants during examination - None

Learning Objective - FW 006

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7 / 45.5

Comments -

47. 061 K5.01 001

Given the following plant conditions:

"B" MFP is OOS for Maintenance and the following occurs:

- The Reactor was manually Tripped while operating at 20% RTP due to a trip of "A" MFP
- Tave is 546°F and lowering.
- PZR Level is 22% and slowly lowering.
- RCS Pressure is 2045 psig and lowering.
- Steam Generator Blowdown is Isolated.
- S/G levels are as follows:
 - "A" S/G Narrow Range level is 42% and slowly rising.
 - "B" S/G Narrow Range level is 41% and slowly rising.
 - "C" S/G Narrow Range level is 45% and slowly rising.

Which ONE (1) of the following provides the action(s) that are required to be taken next IAW EPP-4, Reactor Trip Response?

- A. Initiate Safety Injection
- B. Borate to Cold Shutdown Boron
- C✓ Reduce Auxiliary Feedwater Flow
- D. Close the MSIVs & MSIV Bypasses

The correct answer is C.

A. Incorrect - Safety Injection initiation criteria have not been met. PZR is greater than 10%. PZR is lowering due to the RCS cooldown.

B. Incorrect - EPP-4 will only direct borating to CSD Boron if RCS temperature lowers to less than 530°F.

C. Correct - EPP-4 will direct the operator to reduce total feed flow to stop cooldown since S/Gs are greater than 8%, S/G Blowdown is isolated and Tave is less than 547°F and lowering.

D. Incorrect - Closure of the MSIVs and MSIV Bypasses is only required if the reduction in feed flow does not stop the cooldown.

ILC-11-2 NRC Exam

Question 47

Tier/Group 2 / 1

K/A Importance Rating - RO 3.6 SRO 3.9

Knowledge of the operational implications of the following concepts
as they apply to the AFW: Relationship between AFW flow and RCS heat transfer.

Reference(s) - Sim/Plant design, System Description, EPP-4, EPP-Foldout H

Proposed References to be provided to applicants during examination - None

Learning Objective - AFW 010

Question Source - ILC-11-1 NRC Exam

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 45.7

Comments - K/A met because candidate must analyze plant conditions given following a plant trip due to a loss of main feedwater. Based on this analysis the candidate must identify the effect of AFW flow due to RCS temperature lowering and determine the appropriate actions of reducing AFW flow.

MAB Comment:

It looks like this question was used on a recent NRC exam (ILT 11-1). What methodology was used to select this question? How did you ensure that you randomly selected among all of your bank questions that met this KA? **I search through our multiple banks and this was the only exact K/A match identified. If multiple K/A matches are found then the questions are numbered and selected based on a random number generator on Random.org.**

No comments on the question itself.

48. 061 K6.02 001

Given the following plant conditions:

- The Plant is in Mode 3.
- "B" MDAFW pump is running.
- A small feedline break occurs between FCV-1425, MDAFW pump "B" FCV, and isolation valve V2-16C, SG C AFW Isolation Valve.
- FCV-1425 is closed and the break flow stops.

The CRS has directed isolation of the leak from all water sources.

Which ONE (1) of the following identifies the SGs available to be fed from "A" MDAFW pump?

- A. S/G "A" ONLY
- B. S/G "B" ONLY
- C✓ S/Gs "A" and "B" ONLY
- D. S/Gs "A", "B" and "C"

The correct answer is C.

- A. Incorrect. "B" S/G can be fed using "A" MDAFW pump through V2-16B.
- B. Incorrect. "A" S/G can be fed using "A" MDAFW pump through V2-20A and V2-16A.
- C. Correct.
- D. Incorrect. The break location requires that V2-16C and V2-20B be closed. "C" S/G would have to be fed via the SDAFW pump in an emergency condition.

Question 48

Tier/Group 2 / 1

K/A Importance Rating - RO 2.6 SRO 2.7

Knowledge of the effect that a loss or malfunction of the following will have on the AFW Components: Pumps.

Reference(s) - SD-042, Figure 2, Page 39 of 50

Proposed References to be provided to applicants during examination - NONE

Learning Objective - AFW 003

Question Source - BANK (Last used on 2007 NRC Exam.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.7

Comments -

49. 062 A2.10 001

Given the following plant conditions:

- Unit operating at 50% RTP.
- "A" Train of CR HVAC is in service.
- Breaker 52/21A, Feed to MCC-5 (NORM POWER) & MCC-16, trips open.
- CRS has directed that MCC-5 be transferred to the DS Bus.

Which ONE (1) of the following completes the statements below?

MCC-16 (1) re-energize when MCC-5 is transferred to the DS Bus.

"A" Train of Control Room HVAC (2) be available.

A. (1) will

(2) will

B. (1) will

(2) will NOT

C✓ (1) will NOT

(2) will NOT

D. (1) will NOT

(2) will

The correct answer is C.

A. Incorrect - The feeder breaker on 480V Bus E-1 is a double lugged breaker and feeds both MCC-5 and 16. The kirk key switch for MCC-5 transfer is downstream of the cable split which only supplies MCC-5 from the DS Bus when the kirk key switch is transferred. This causes MCC-16 to remain de-energized when the kirk key switch is transferred to the DS Bus. "A" Train of CR HVAC is powered from MCC-16 and will not be available while MCC-5 is powered from the DS Bus.

B. Incorrect - See discussion in "A" above.

C. Correct - "B" Train of CR HVAC will start automatically upon a loss of "A" train.

D. Incorrect - "A" Train will not have power available due to the MCC-16 being de-energized.

Question 49

Tier/Group 2/1

K/A Importance Rating - RO 3.0 SRO 3.3

Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Effects of switching power supplies on instruments and controls

Reference(s) - Sim/Plant design, System Description, EDP-003

Proposed References to be provided to applicants during examination - None

Learning Objective - VAC 005

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 43.5 / 45.3 / 45.13

Comments -

50. 063 A1.01 001

Given the following plant conditions:

- A Loss of Offsite Power has occurred.
- BOTH EDGs have failed to auto start.
- EPP-1, Loss of All AC Power, has been implemented.

Which ONE (1) of the following completes the statement below with respect to load shedding and station battery design?

IAW EPP-1, low priority loads (1) required to be shed from Instrument Buses 2 and 3 to minimize the discharge rate on both DC buses to assure that the station batteries achieve their (2) design time limitation.

A. (1) are

(2) 30 minute

B✓ (1) are

(2) 1 hour

C. (1) are NOT

(2) 30 minute

D. (1) are NOT

(2) 1 hour

The correct answer is B.

A. Incorrect - The first part of distractor is correct. PATH-1 has a continuous action step that requires a battery charger to be restarted within 30 minutes of a power loss. The 30 minutes is to allow for a 30 minute margin to the design limit of 1 hour and ensures that the batteries are not completely discharged.

B. Correct.

C. Incorrect - EPP-1, Attachment 2, Load Shed Listing, contains a list of all low priority loads that are to be shed to extend the life of the batteries. Attachment 2 contains loads from both DC buses and Instrument Buses 2, 7B and 3. Instrument Buses 2 and 3 are powered from Inverters A and B, respectively. PATH-1 has a continuous action step that requires a battery charger to be restarted within 30 minutes of a power loss. The 30 minutes is to allow for a 30 minute margin to the design limit of 1 hour and ensures that the batteries are not completely discharged.

D. Incorrect - EPP-1, Attachment 2, Load Shed Listing, contains a list of all low priority loads that are to be shed to extend the life of the batteries. Attachment 2 contains loads from both DC buses and Instrument Buses 2, 7B and 3. Instrument Buses 2 and 3 are powered from Inverters A and B, respectively. The second part of the distractor is correct.

Question 50

Tier/Group 2/1

K/A Importance Rating - RO 2.5 SRO 3.3

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

Reference(s) - Sim/Plant design, System Description, EPP-1, EPP-1BD

Proposed References to be provided to applicants during examination - None

Learning Objective - DC 004

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.5 / 45.7

Comments -

MAB Comment: The question statement does not address both parts of the question – it only asks for the time limitations. The question should solicit everything being asked for in the fill in the blank and answer choices. **Added "and required actions to achieve this time limitation" to the stem of the question.**

C(1) and D(1) are not plausible. You have provided the applicants with two kinds of loads to be shed, both of which would reduce load on the batteries. It is not credible that the applicant would choose to shed an inverter when the other choice is a LOW priority load. **Revised the question to ask if loads are shed from both DC buses AND IB or DC buses ONLY.**

Revise the stem of the question to ask "Which ONE (1) of the following completes the statement below with respect to load shedding and station battery design?" instead of "Which ONE (1) of the following identifies the time limitations of the design capacity of the station batteries and required action to achieve this time limitation?". Revision based on validation comments.

51. 064 K6.07 001

Given the following plant conditions:

- APP-010-B2, EDG A START AIR LO PRESS, has been received.
- EDG A Air Receiver relief valve DA-11A has lifted and blown down the air receiver pressure to 80 psig prior to reseating.

Which ONE (1) of the following identifies the LOWEST pressure at which the "A" EDG Air Receiver will be pressurized to a value that supports 8 cold starts of the EDG?

- A. 100
- B✓ 210
- C. 216
- D. 220

Answer is B

A. Incorrect - At 100 psig the EDG is assured to start once if called upon.

B. Correct - 210 psig is the ITS LCO 3.8.3 limit and assures that at least 8 cold starts of the EDG can be performed.

C. Incorrect - The 216 psig air receiver pressure is the AIR START LO PRESS alarm setpoint.

D. Incorrect - The 220 psig air receiver pressure is the automatic starting pressure setpoint for the EDG Air Compressor when in AUTO.

ILC-11-2 NRC Exam

Question 51

Tier/Group 2/1

K/A Importance Rating - RO 2.7 SRO 2.9

Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Air receivers

Reference(s) - Sim/Plant design, OP-604, APP-010, ITS 3.8.4

Proposed References to be provided to applicants during examination - None

Learning Objective - EDG 008

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7 / 45.7

Comments -

MAB Comments:

What benefit does it add to test their ability to extrapolate to a point in time that coincides with a certain value? This is at least the third question that has done this. Does your air compressor raise pressure at a linear rate of 1 psig/min? If not, then this is not an operationally valid question. Also, would you expect an operator to know the rate at which a compressor will charge your EDG air receivers and then calculate the time that will support 8 cold starts? Is this testing meaningful information? **Revised the question to simply ask for the EDG air receiver pressure value that supports 8 cold starts of the EDG.**

I see no supporting documentation that supports the air receivers raising pressure at 1 psig/min.

Suggest just testing the various pressures (100, 210, 216, and 220).

52. 073 G2.2.12 001

Given the following plant conditions:

- OST-924-2, Process Radiation Monitoring System, Section 8.10, Fuel Handling Building Upper Level Monitor Test, is in progress.
- The CKT TEST pushbutton on R-21 has been depressed and held in the depressed position.

Given the above conditions, which ONE(1) of the following completes the statement?

While the CKT TEST pushbutton is depressed, the operator is required to check HVS-4 and (1) **OFF** and when the CKT TEST pushbutton is released those fans are required to be checked (2).

HVS-4, Fuel Handling Building Supply Air Handling Unit
HVE-15, Spent Fuel Building Exhaust Air Handling Unit
HVE-15A, Spent Fuel Building Exhaust Air Handling Unit

A✓ (1) HVE-15

(2) ON

B. (1) HVE-15

(2) OFF

C. (1) HVE-15A

(2) ON

D. (1) HVE-15A

(2) OFF

The correct answer is A.

A. Correct

B. Incorrect - The automatic functions provided by the Process Rad. Monitor will be deactivated when the CKT TEST pushbutton is released. This is also specified in the OST to verify that the fans are ON once the CKT TEST pushbutton is released.

C. Incorrect - HVE-15A includes charcoal filters and is placed in service when performing spent fuel activities. HVE-15A provides filtered exhaust for the spent fuel building with HVS-4 providing the supply. R-21 does not have any automatic functions associated with HVE-15A.

D. Incorrect - HVE-15A includes charcoal filters and is placed in service when performing spent fuel activities. HVE-15A provides filtered exhaust for the spent fuel building with HVS-4 providing the supply. R-21 does not have any automatic functions associated with HVE-15A.

Question 52

Tier/Group 2/1

K/A Importance Rating - RO 3.7 SRO 4.1

Process Radiation Monitoring (PRM) System: Knowledge of surveillance procedures.

Reference(s) - Sim/Plant design, OP-924-2, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - RMS 009

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 45.13

Comments -

MAB Comments:

Add to the question statement that you are asking the question with the CKT TEST pushbutton depressed iaw OST-924-2. I.E. Given the above conditions, which one of the following completes the statement? **Revised stem of question as recommended.**

53. 076 G2.4.18 001

Given the following plant conditions:

- A plant trip and safety injection has occurred due to multiple events.
- The crew is implementing PATH-1.
- "C" and "D" SW Pumps have tripped and cannot be restarted.
- North and South SW Header pressures are 35 psig.

Which ONE(1) of the following completes the statement below?

Based on the conditions given above, an action required by PATH-1 to isolate the Service Water Supply to the Turbine Building is to close valve (1) and the basis for this action is to ensure (2).

A. (1) V6-16A, SW NORTH HEADER SUPPLY TO TURBINE BUILDING

(2) adequate cooling flow to the EDGs

B✓ (1) V6-16C, SW ISOLATION TO TURBINE BUILDING

(2) adequate cooling flow to the EDGs

C. (1) V6-16A, SW NORTH HEADER SUPPLY TO TURBINE BUILDING

(2) SW Booster Pumps will NOT trip on low SW pressure

D. (1) V6-16C, SW ISOLATION TO TURBINE BUILDING

(2) SW Booster Pumps will NOT trip on low SW pressure

The correct answer is B.

A. Incorrect - Only closing V6-16A will not isolate SW to the Turbine Building. V6-16B must also be closed or V6-16C. Candidate may think that since "C" and "D" SWPs tripped that V6-16A is the only valve required to be closed since these pumps supply the North Header. The second part of the distractor is correct.

B. Correct -

C. Incorrect - Only closing V6-16A will not isolate SW to the Turbine Building. V6-16B must also be closed or V6-16C. Candidate may think that since "C" and "D" SWPs tripped that V6-16A is the only valve required to be closed since these pumps supply the North Header. Under normal and blackout conditions, if SW Booster pump suction pressure drops below 12 psig for 10 seconds the SW Booster pump will trip. However, this is not the bases for isolating the turbine building on low header pressure.

D. Correct. The first part of the distractor is correct. Under normal and blackout conditions, if SW Booster pump suction pressure drops below 12 psig for 10 seconds the SW Booster pump will trip. However, this is not the bases for isolating the turbine building on low header pressure.

Question 53

Tier/Group 2/1

K/A Importance Rating - RO 3.3 SRO 4.0

Service Water System (SWS): Knowledge of the specific bases for EOPs.

Reference(s) - Sim/Plant design, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - SW 007

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.1 / 45.13

Comments -

MAB Comments:

ONLY does not work in this case. Will PATH-1 have the operators close ANYTHING else? More precise language needs to be used here. I understand why you tried to use ONLY, because just closing 16A, without also closing 16B, will not isolate SW to the turbine building. By wording it in this fashion, there is also an argument that there is no correct answer because closing 16C is not the only valve that PATH-1 will direct to be closed.

Added "to isolate the Service Water Supply to the Turbine Building" to the stem of the question. Removed the word "ONLY" from the stem.

54. 078 K2.02 001

Given the following plant conditions:

- The unit tripped due to a loss of off-site power.
- "A" EDG output breaker failed to close and cannot be manually closed.
- EPP-25, Energizing Supplemental Plant Equipment using the DSDG, has been completed.

Which ONE(1) of the following identifies the air compressor(s) available to be restarted under these conditions?

- A. Instrument Air Compressor "A" ONLY
- B. Instrument Air Compressor "B" ONLY
- C✓ Instrument Air Compressors "A" AND "B" ONLY
- D. Instrument Air Compressors "A" AND "B" and the Primary Air Compressor.

The correct answer is C.

A. Incorrect. "B" IAC is also available since E-2 is energized.

B. Incorrect. "A" IAC is also available since MCC-5 has been energized by the DSDG. This answer would have been correct had EPP-25 not been implemented.

C. Correct.

D. Incorrect. The Primary Air Compressor is powered from 480V Bus 2A. EPP-25 does have steps to perform a backfeed that could re-energize 480V Bus 2A, however, this was not given in the stem of the question.

Question 54

Tier/Group 2/1

K/A Importance Rating - RO 3.3 SRO 3.5

Knowledge of bus power supplies to the following: Emergency air compressor

Reference(s) - Sim/Plant design, System Description, EDPs, EPP-25

Proposed References to be provided to applicants during examination - None

Learning Objective - AIR 005

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7

Comments -

55. 103 A4.09 001

Given the following plant conditions:

Initial Conditions

- Plant is in Mode 3 at 547°F and 2235 psig.
- A spurious Safety Injection signal has been received.

Current Conditions

- EPP-7, SI Termination, has been completed.
- APP-002-B7, CV NAR RANGE HI/LO PRESS illuminates.
- CV Pressure indicates - **0.4** psig and degrading.

Which ONE (1) of the following identifies the actions necessary to clear the alarm IAW OP-921, Containment Air Handling?

- A. Reset Phase "A" and open Containment Pressure Relief Valves V12-10 and V12-11.
- B. Reset Containment Ventilation Isolation and open Containment Pressure Relief Valves V12-10 and V12-11.
- C✓ Reset Containment Ventilation Isolation and open Containment Vacuum Relief Valves V12-12 and V12-13.
- D. Reset Phase "A" and open Containment Vacuum Relief Valves V12-12 and V12-13.

The correct answer is C.

A: Incorrect. Resetting the Phase "A" will not allow the Pressure Relief Valves to open. The Containment Ventilation signal must be reset. Additionally, the vacuum relief valves are required to be opened based on given plant conditions.

B: Incorrect. The first part of the distractor is correct. The vacuum relief valves are required to be opened based on the given plant conditions, not the pressure relief valves.

C: Correct. Opening the CV Vacuum Relief valves will correct a negative pressure in the CV.

D: Incorrect. Resetting Phase "A" will not allow the vacuum relief valves to open. The Containment Ventilation Isolation signal must be reset.

ILC-11-2 NRC Exam

Question 55

Tier/Group 2/1

K/A Importance Rating - RO 3.1 SRO 3.7

Ability to manually operate and/or monitor in the control room: Containment vacuum system.

Reference(s) - Sim/Plant design, OP-921 Section 8.4.3, APP-002

Proposed References to be provided to applicants during examination - None

Learning Objective -CV-007, CVHVAC Objective 3

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7 / 45.4 to 45.8

Comments -

It looks like this question was used on a recent NRC exam (ILT 11-1). How was this question selected

ES-401: If the bank contains more than one question that fits a specific K/A statement, randomly select from among the available questions unless there is an appropriate basis for selecting a specific question (e.g., higher cognitive level, better discrimination validity, more operationally oriented, or site-specific priority).

No further comments. **A search was performed of our various test banks and this was the only question identified that had the exact K/A match. If additional questions are found with the exact K/A match then they are assigned a number and selected based on a random number generator from Random.org.**

56. 001 A3.05 001

Given the following plant conditions:

- The plant is operating at 25% RTP.
- Control Bank C step counters indicate **225 steps**.
- Control Bank D step counters indicate **105 steps**.
- Rod Control is in AUTOMATIC.
- A malfunction in the Automatic Rod Control Circuitry causes the rods to insert.
- The rods are stopped when the Rod Bank Selector Switch is taken to Manual(M).
- The Group Step Counters for Control Bank C and D did not function properly.
- A review of ERFIS identified that Control Bank D Rods inserted **10 inches**.

Which ONE(1) of the following identifies what the Group Step Counters for Control Banks C and D would indicate if operating properly?

	<u>Bank C</u>	<u>Bank D</u>
A✓	217 steps	89 steps
B.	223 steps	95 steps
C.	215 steps	95 steps
D.	209 steps	89 steps

The correct answer is A.

A. Correct. 10 inches equates to 16 steps. Control Bank D will step in 16 steps to 89 steps. Control Bank C will not begin stepping in until Control Bank D is at 97 steps. Control Bank C will therefore only step in 8 steps to a final position of 217 steps.

B. Incorrect - This distractor incorrectly correlates 10 inches of IRPI to 10 steps on the Group Step Counters. The distractor for Bank C has to correct overlap assuming 10 steps on Bank D.

C. Incorrect - This distractor incorrectly correlates 10 inches of IRPI to 10 steps on the Group Step Counters. The distractor for Bank C does not account for the proper overlap and incorrectly assumes that the Bank C rods will move once Bank D rods begin to insert.

D. Incorrect - The position given for Bank D is correct. The position given for Bank C does not account for proper overlap and incorrectly assumes that the Bank C rods will move once Bank D rods begin to insert.

ILC-11-2 NRC Exam

Question 56

Tier/Group 2/2

K/A Importance Rating - RO 3.5 SRO 3.5

Ability to monitor automatic operation of the Control Rod Drive System, including:
Individual vs. group rod position

Reference(s) - Sim/Plant design, System Description, ITS

Proposed References to be provided to applicants during examination - None

Learning Objective -RDCNT 007

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.13

Comments - .

57. 011 K2.02 001

Which ONE (1) of the following identifies (in the order presented) the normal power supplies for the Pressurizer Heaters?

Control Group _____, Backup Group A _____, Backup Group B _____

1. 480V Bus 1
2. 480V Bus 2A
3. 480V Bus 2B
4. 480V Bus 3

A. ✓ 3, 1, 2

B. 3, 2, 4

C. 4, 3, 1

D. 2, 1, 3

The correct answer is A.

A. Correct.

B. Incorrect. First P/S is correct. Bus 2A is the P/S for B/U Group B. Bus 3 does not provide normal power supply but is used if necessary to energize pressurizer heaters through the DS Bus.

C. Incorrect. Bus 3 does not provide normal power supply but is used if necessary to energize pressurizer heaters through the DS Bus. The second and third choices do provide power to PZR heaters, just not to those groups.

D. Incorrect. All three of the busses provide power to pressurizer heaters, they are listed in the incorrect order.

Question 57

Tier/Group 2/2

K/A Importance Rating - RO 3.1 SRO 3.2

Knowledge of bus power supplies to the following: PZR heaters

Reference(s) - Sim/Plant design, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - PZR 005

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7

Comments -

58. 015 K6.01 001

Given the following plant conditions:

- Plant is at 100% RTP.

The following alarms are subsequently received:

- APP-005-A3, PR DROP ROD
- APP-005-C3, PR CHANNEL DEV
- APP-005-F3, PR UPPER CH HI FLUX DEV / AUTO DEFEAT
- It has been determined that N-44 Power Range Detector A failed LOW

Which ONE (1) of the following completes the statement below?

The NI-44C, Delta Flux Meter, will indicate pegged (1) and the Rod Control Selector Switch is (2) to be selected to the MANUAL (M) position.

- A. (1) HIGH
(2) NOT required
- B. (1) HIGH
(2) required
- C✓ (1) LOW
(2) NOT required
- D. (1) LOW
(2) required

The correct answer is C

Detector A is the upper detector for the power ranges. The failure of the detector low will cause the % power indication on N-44 to deflect to approximately half of the actual power level, since the upper and lower detectors combine through a summator to create the overall % power output on the NI drawer. The delta flux meter is driven from the QTop - QBottom = Delta flux signal. The QTop signal has been lost and will drive the output of the delta flux circuit negative, and thus indicate pegged low. APP-005-F3, PR UPPER CH HI FLUX DEV will be received and the Misc Drawer will indicate that an upper section deviation has occurred.

EC67518 removed the power mismatch circuitry associated with N-44 in October 2008. In the past a failure of N-44 would require the operator to place the rods in manual to stop rod motion.

ILC-11-2 NRC Exam

Question 58

Tier/Group 2/2

K/A Importance Rating - RO 2.9 SRO 3.2

Knowledge of the effect of a loss or malfunction on the following will have on the NIS:
Sensors, detectors, and indicators

Reference(s) - Sim/Plant design, System Description, OWP-011, APP-005, FMP-009

Proposed References to be provided to applicants during examination - None

Learning Objective - NIS SD-010-010

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.7

Comments -

MAB Comments:

"D" is not plausible. The interplay between the first and second half does not make sense. If the lower section fails low, then all (or most) power would be indicated in the top. Therefore making the delta high. Even if an applicant has a misconception that the delta was an absolute value, the number would still be high, not low.

"A" also has minimal credibility.

The alarm in question should be referred to by its official designation and name as you have on other questions. What is the official designation for the Section Deviation Alarm?

Revised the stem of question to include the expected APP-005 alarms with official designations. Revised the actual question. No longer asking the designation of the alarm. The question now asks the expected Delta Flux Meter AND N-42, Power Range A Percent Full Power indications.

59. 016 K3.09 001

Given the following plant conditions:

- The plant is in Mode 3 with GP-007, Plant Cooldown from Hot Shutdown to Cold Shutdown, in progress.
- RCS is at 510°F and 1150 psig.
- The PZR PRESS / HI STM LINE DP switch has failed to block the HI STM LINE DP signal.

Which ONE(1) of the following completes the statement below?

If the cooldown continues, the highest S/G pressure at which a HI STEAM LINE DP Safety Injection will be received is _____ psig.

- A. 685
- B. 614
- C. 585
- D✓ 485

The correct answer is D.

A. Incorrect - 685 psig is 100 psig ABOVE the steam header pressure electronically limited minimum value of 585 psig. Candidate would have to think that the setpoint was line minus header instead of header minus line.

B. Incorrect - 614 psig is the low steam line pressure setpoint in the high steam line flow logic.

C. Incorrect - 585 psig is electronically limited minimum value for the steam header pressure.

D. Correct.

ILC-11-2 NRC Exam

Question 59

Tier/Group 2/2

K/A Importance Rating - RO 3.5 SRO 3.7

Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: ESFAS

Reference(s) - Sim/Plant design, System Description, Logic Diagrams

Proposed References to be provided to applicants during examination - None

Learning Objective - ESF 004

Question Source - BANK (Not used on an NRC Exam form 2004 to present.)

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 45.6

Comments -

MAB Comments: "A" and "C" are not plausible. We are evaluating high dP between steam lines. Therefore, if the same failures, whether it be high or low, occur on each steam line, then how does that impact differences between the steam lines?

At RNP, high steam line D/P is calculated by subtracting steam line pressure from the steam header pressure (ie. $P_{\text{header}} - P_{\text{line}}$). This SI signal only requires one S/G to have the condition, which is a concept that is often missed by candidates.

60. 028 A4.02 001

Given the following plant conditions:

- A LOCA has just occurred and CV Pressure indicates 15 psig on ERFIS.

Which ONE(1) of the following completes the statement below?

In addition to ERFIS and AR-100C, CV Conditions Recorder, CV Pressure is indicated in the control room by (1) Wide Range Indicators on the RTGB and (2) Extended Range indicator(s) on the PAM Panel.

A. (1) three

(2) one

B✓ (1) six

(2) two

C. (1) six

(2) one

D. (1) three

(2) two

The correct answer is B.

A. Incorrect - There are six pressure indicators enclosed in three edge meter panels. Two indications per edge meter panel. There is only one narrow range indicator on the RTGB, however, there are two extended range indicators on the PAM Panel.

B. Correct

C. Incorrect - The first part is correct. There is only one narrow range indicator on the RTGB, however, there are two extended range indicators on the PAM Panel.

D. Incorrect. There are six pressure indicators enclosed in three edge meter panels. Two indications per edge meter panel. The second part of distractor is correct.

ILC-11-2 NRC Exam

Question 60

Tier/Group 2/2

K/A Importance Rating - RO 3.7 SRO 3.9

Ability to manually operate and/or monitor in the control room: Location and interpretation of containment pressure indications

Reference(s) - Sim/Plant design, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - CV 005

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7 / 45.5 to 45.8

Comments -

61. 041 G2.4.11 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- A 20% Secondary Load Rejection has occurred.
- Steam dump valves did **NOT** actuate.

Which ONE (1) of the following identifies the sequence of actions required to be performed IAW AOP-015, Secondary Load Rejection, to operate the steam dump valves to reduce RCS Tavg?

- A. Place PC-464B, Steam Header Press Controller, in Manual and adjust output as necessary.
- B. Place the Steam Dump Mode Switch to STEAM PRESS and manually adjust output as necessary.
- C✓ Place PC-464B, Steam Header Press Controller, in Manual and adjust output to MINIMUM. Place the Steam Dump Mode Selector Switch to STEAM PRESS and manually adjust output as necessary.
- D. Place the Steam Dump Mode Switch to RESET, then place the switch to STEAM PRESS and manually adjust output as necessary.

The correct answer is C.

A. Incorrect - The steam dumps will be operated in Manual. However, Steam Dump Mode Selector Switch must be placed in STEAM PRESS before the steam dumps will respond to a manual signal.

B. Incorrect - These actions would cause the steam dumps to open rapidly if a demand signal was present on PC-464B. To prevent the steam dumps from potentially instantly opening due to a large demand signal the controller is adjusted to MINIMUM prior to selecting STEAM PRESS mode.

C. Correct. The output on the controller is verified first to be at zero prior to transferring to steam pressure mode. This will prevent the steam dump from instantly opening due to a large demand signal.

D. Incorrect - These actions will not cause the steam dumps to operate since there will be no output signal on PC-464B. With these actions taken, if the controller had been placed in Manual and output adjusted the steam dumps would have operated.

ILC-11-2 NRC Exam

Question 61

Tier/Group 2/2

K/A Importance Rating - RO 4.0 SRO 4.2

Steam Dump System (SDS) and Turbine Bypass Control: Knowledge of abnormal condition procedures.

Reference(s) - Sim/Plant design, AOP-015

Proposed References to be provided to applicants during examination - None

Learning Objective - SD 008

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.13

Comments -

MAB Comments:

"D" does not appear to be plausible. No justification is supplied for its plausibility. Would BYPASS TAVG INTERLOCK ever be used at power with higher RCS temperatures? **Revised "D" to remove "Place the Steam Dump Control Switch momentarily to Bypass Tavg Interlock."**

62. 071 K1.06 001

Given the following plant conditions:

- Plant is in Mode 3.
- A release is in progress from "A" Waste Gas Decay Tank.
- R-14C, PLANT STACK NOBLE GAS LOW RANGE, **FAIL** light illuminates.

Which ONE (1) of the following completes the statement below?

The condition would cause (1) to alarm and RCV-014, Waste Gas Release Isolation, would (2) .

- A. (1) APP-036-E7, RAD MONITOR TROUBLE,
(2) remain OPEN
- B✓ (1) APP-036-E7, RAD MONITOR TROUBLE,
(2) CLOSE
- C. (1) APP-036-D8, PROCESS MONITOR HI RAD,
(2) remain OPEN
- D. (1) APP-036-D8, PROCESS MONITOR HI RAD,
(2) CLOSE

The correct answer is B.

A. Incorrect. A FAIL signal for R-14C will send a signal to automatically close RCV-014 to terminate the release. The FAIL light for R-18, R-11 and R-12 will not cause automatic actions to secure releases via their applicable paths.

B. Correct.

C. Incorrect. No high radiation condition exists, therefore the HI RAD alarm would not be illuminated. This alarm could be received from temporary spikes or malfunctions, which is why the alarm is verified in APP-036 action steps. The FAIL light for R-18, R-11 and R-12 will not cause automatic actions to secure releases via their applicable paths.

D. Incorrect - No high radiation condition exists, therefore the HI RAD alarm would not be illuminated. This alarm could be received from temporary spikes or malfunctions, which is why the alarm is verified in APP-036 action steps. Second half of distractor is correct.

ILC-11-2 NRC Exam

Question 62

Tier/Group 2/2

K/A Importance Rating - RO 3.1 SRO 3.1

Knowledge of the physical connections and/or cause-effect relationships between the Waste Gas Disposal System and the following systems: ARM and PRM systems

Reference(s) - Sim/Plant design, APP-036

Proposed References to be provided to applicants during examination - None

Learning Objective - RMS 009

Question Source - BANK (Has not been used on NRC Exam from 2004 to present.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.2 TO 41.9 / 45.7 TO 45.8

Comments -

63. 072 K5.01 001

Given the following plant conditions:

- R-4, Charging Pump Room, is in alarm and has been validated.
- All non-essential personnel have been evacuated from the Charging Pump Room.
- The reason for the alarm is unknown.

Which ONE(1) of the following completes the statement below?

R-4, Charging Pump Room, Area Radiation Monitor measures (1) and the **NEXT** required action to be performed IAW AOP-005, Radiation Monitoring System, is to (2).

- A. (1) both gamma and beta
(2) align the Auxiliary Building Exhaust through the Charcoal Filter Unit
- B. (1) gamma ONLY
(2) align the Auxiliary Building Exhaust through the Charcoal Filter Unit
- C. (1) both gamma and beta
(2) inspect the room for system leakage
- D✓ (1) gamma ONLY
(2) inspect the room for system leakage

The correct answer is D.

A. Incorrect - R-4 utilizes a detector that is a halogen quenched GM tube to measure gamma fields. The tube is placed in a phenolic tube holder, which is used as a beta shield. If leakage is identified in the Charging Pump Room then the Charcoal Filter Unit will be aligned.

B. Incorrect - The first part of the distractor is correct. If leakage is identified in the Charging Pump Room then the Charcoal Filter Unit will be aligned.

C. Incorrect - R-4 utilizes a detector that is a halogen quenched GM tube to measure gamma fields. The tube is placed in a phenolic tube holder, which is used as a beta shield. The second part of the distractor is correct.

D. Correct. A leak must be identified in the Charging Pump Room prior to aligning the Auxiliary Building Charcoal Filter Unit.

ILC-11-2 NRC Exam

Question 63

Tier/Group 2/2

K/A Importance Rating - RO 2.7 SRO 3.0

Knowledge of the operational implications of the following concepts as they apply to the ARM system: Radiation theory, including sources, types, units, and effects

Reference(s) - Sim/Plant design, System Description, AOP-005

Proposed References to be provided to applicants during examination - None

Learning Objective - RMS 002

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.6 / 45.4

Comments -

MAB Comments:

Why is the second part of the answer choices included? Just with part (1) alone, you have provided 4 unique answer choices, therefore none of part (2) is needed to arrive at the correct answer. Only information that is needed to make that answer choice unique should be included. Extra information only acts to lower the credibility of the distracters by providing additional ways to disqualify that distractor. Knowledge of the KA must be required to arrive at the correct answer in order to meet the KA. In this case, all I need to know is what is detected and how does the instrument display it. Operational implications needs to be tested to meet the KA.

Revised the question to ask what types of radiation R-4 measures and the required action in AOP-005 for a valid R-4 alarm. Revised stem of the question to support the required answers.

Bolded the word "NEXT" in the stem of the question. Resulted from validation comments.

64. 079 K4.01 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- A loss of Instrument Air has occurred with pressure currently at 75 psig.
- The crew is implementing AOP-017, Loss of Instrument Air.

Which ONE(1) of the following identifies the preferred flowpath when Station Air is required to be cross-connected with Instrument Air IAW AOP-017?

Flow is from the Station Air Compressor ----->

- A. ✓ Station Air coalescing filter -----> Instrument Air Header
- B. bypass the Station Air coalescing filter -----> Instrument Air Dryers A/B -----> Instrument Air Header
- C. Station Air coalescing filter -----> Instrument Air Dryers A/B -----> Instrument Air Header
- D. bypass the Station Air coalescing filter -----> Instrument Air Header

The correct answer is A.

A. Correct

B. Incorrect - AOP-017 does give an option to bypass the coalescing filter if the inlet and/or outlet to the filter cannot be opened. This is not preferred since SA has high oil and moisture content. Normal instrument air flow goes through the air dryers. A flowpath does not exist for SA to go through the air dryers. In AOP-017, an option does exist to bypass the IA dryers if necessary to provide IA from the IA compressors.

C. Incorrect - A flowpath does not exist for SA to go through the air dryers. Normal instrument air flow does go through air dryers to remove moisture.

D. Incorrect - This flowpath is an option if the inlet and/or outlet to the filter cannot be opened. This is not preferred since SA has high oil and moisture content.

ILC-11-2 NRC Exam

Question 64

Tier/Group 2/2

K/A Importance Rating - RO 2.9 SRO 3.2

Knowledge of SAS design feature(s) and/or interlock(s) which provide for the following:
Cross-connect with IAS

Reference(s) - Sim/Plant design, System Description, AOP-017

Proposed References to be provided to applicants during examination - None

Learning Objective - AIR 009

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7

Comments -

65. 086 A1.05 001

Given the following plant conditions:

- During clearance restoration on a drained section of Fire Water piping an isolation valve is opened too quickly and Fire Water pressure drops to 83 psig.

Based on the conditions given, which ONE (1) of the following identifies the impact on the Fire Water Pumps?

MDFP - Motor Driven Fire Pump

EDFP - Engine Driven Fire Pump

- A. ✓ MDFP will start immediately AND the EDFP will start following a 2 sec. time delay
- B. MDFP will start following a 2 sec. time delay and the EDFP will start immediately
- C. MDFP AND EDFP will both start following a 2 sec. time delay
- D. MDFP AND EDFP will both start immediately

The correct answer is A.

A. Correct.

A. Incorrect - The MDFP will start immediately and the EDFP will start following a 2 sec. time delay. The candidate may feel the time delay is warranted on the MDFP to minimize excessive starting currents on the electrical bus.

C. Incorrect. Only the EDFP has a 2 sec. time delay. Candidate may think both pumps have a time delay to prevent spurious starting of either pump from pressure spikes.

D. Incorrect. Candidate may not think a time delay is prudent for fire pumps and think they both start immediately.

ILC-11-2 NRC Exam

Question 65

Tier/Group 2/2

K/A Importance Rating - RO 2.9 SRO 3.1

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Fire Protection System operating the controls including: FPS lineups

Reference(s) - Sim/Plant design, System Description, OST-603

Proposed References to be provided to applicants during examination - None

Learning Objective - FPW 006

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.5 / 45.5

Comments -

MAB Comments:

The supporting documentation suggests that the MDFP may not start until 95 or 96 psig. The documentation suggests that the MDFP could start anywhere between 95 and 105 psig. Does this mean that it is possible that someone could argue that "A" is an alternate correct answer?

"C" is not plausible. I am having trouble believing that someone would think that an engine would be started before an electrical motor would be used.

Changed the stem of the question to have the fire water pressure drop to 83 psig. Question tests the knowledge of the starting sequence for the various fire water pumps associated with a time delay.

66. G2.1.15 001

Which ONE (1) of the following statements identifies the administrative requirements of Standing Instructions IAW OPS-NGGC-1000, Fleet Conduct of Operations?

- A. A member of plant management is required to be listed as the Closure Contact.
- B. Standing Instructions shall NOT be used to communicate emergency technical specification changes that have NOT been formally issued.
- C✓ All active Standing Instructions issued since last standing watch must be reviewed.
- D. Standing Instructions for Operational Issues are NOT required to have an expiration date.

The correct answer is C.

A. Incorrect. The Master Standing Instruction Book - Control Room is required even if a database has been created.

B. Incorrect - IAW OPS-NGGC-1000, Standing Instructions may be utilized to communicate emergency technical specification changes that have not been formally issued.

C. Correct. Only have to review the SIs that were approved since you last stood watch. Periodically review all SIs.

D. Incorrect. Operational Issues SIs have a maximum life of 92 days. SIs used for items to inform the shift of procedural changes have a maximum life of 35 days.

Question 66

Tier 3

K/A Importance Rating - RO 2.7 SRO 3.4

Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc.

Reference(s) - Sim/Plant design, OPS-NGGC-1000

Proposed References to be provided to applicants during examination - None

Learning Objective - Admin Self Study

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 45.12

Comments -

MAB Comments:

OPS-NGGC-1000, Section 9.17.5.1 (f) states that for site-specific standing instructions may use a database OR Attachment 8 (which could be placed in a book). The question appears to pertain to site-specific standing instructions – therefore, could “A” be an alternate correct answer? Is there a procedure contradiction here? Does this warrant a procedure change request? I would think that most standing instructions would be site specific; therefore (f) would be the applicable section to follow. **In all cases, a Master Standing Instruction Book has to be maintained in the control room. This requirements ensures that all Standing Instructions are captured should the Database become corrupted or "crash."**

“B” is not plausible. I understand what you have used for plausibility justification, but it still does not seem credible that someone could pull a procedure off the shelf and begin to use it – not knowing that it has been altered by a standing order. It is only logical to believe that the procedure itself must be changed to ensure that a task is performed correctly.

Revised "B" to "Standing Instructions shall not be used to communicate emergency technical specification changes that have not been formally issued."

67. G2.1.17 001

Given the following plant conditions:

- A plant event is in progress.
- The plant alarms are out-of-service.
- A Site Area Emergency has been declared.

Based on the conditions above, which ONE (1) of the following completes the statements below?

IAW OMM-001-4, Communications, the SM (1) required to communicate through the CRS to have an operator to place the VLC Switch to the emergency position.

IAW OMM-001-7, Notifications, the emergency announcements should be repeated (2) times.

A. (1) is NOT

(2) TWO

B✓ (1) is NOT

(2) THREE

C. (1) is

(2) TWO

D. (1) is

(2) THREE

The correct answer is B.

A. Incorrect - The Emergency Preparedness procedures require that plant announcements for declarations be made twice. However, OMM-001-7 requires that the announcements be made three times if the alarms are OOS.

B. Correct.

C. Incorrect - An acknowledgement from the current Operations shift personnel would ensure that they received and understood the announcement. This is part of normal three-way communication. However, this acknowledgement is not procedurally required.

D. Incorrect - An acknowledgement from both the TSC and EOF would ensure that they received and understood the announcement. This is part of normal three-way communication. However, this acknowledgement is not procedurally required.

Question 67

Tier 3

K/A Importance Rating - RO 3.9 SRO 4.0

Ability to make accurate, clear, and concise verbal reports.

Reference(s) - Sim/Plant design, OMM-001-7

Proposed References to be provided to applicants during examination - None

Learning Objective - Admin Self Study

Question Source - BANK (Last used on the 2007 NRC Exam.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 45.12 / 45.13

Comments -

MAB Comments:

"C" is not plausible. This is a plant announcement - an announcement to the entire plant. When an announcement is made to the entire plant, would it be credible that everyone be required to respond? **Revised "C" to state "until acknowledged by current Operations shift personnel."**

"D" also is not plausible. Nothing in the stem even indicates that the TSC and EOF have been activated. Even if the EOF was activated – it is located off site. Why would there be a requirement for the announcement to be in a continuous do-loop until an off-site acknowledgement is made for an announcement? **At RNP the TSC and EOF are located within the protected area and can hear plant announcements and are in communication with the control room. The EOF does not have the capability to sound alarms and has to contact the control room to sound alarms as necessary. Therefore, it would be credible to think that they would acknowledge announcements if plant alarms are OOS.**

For a plant announcement, what mechanism exists for three way communications? Three way communications typically is done only one to one or in small groups. **Three way communication can occur over the phone when the individual acknowledges the alarm.**

I also noted that this question was used on the 2007 NRC exam.

68. G2.1.27 001

Which ONE (1) of the following completes the statement below?

The Inadequate Core Cooling Monitor (ICCM) is designed to monitor for inadequate core cooling during a _____ .

- A. Large Break LOCA
- B✓ Small Break LOCA
- C. Loss of All AC Power
- D. Loss of Heat Sink Accident

The correct answer is B.

A. Incorrect - The ICCM is capable of surviving a large-break LOCA transient so that it can be used for post-accident monitoring and recovery. However, instrumentation associated with the Reactor Protection System identifies a large-break LOCA and initiated emergency core cooling systems before the control room operator can respond to the ICCM.

B. Correct

C. Incorrect - Parameters are utilized from the ICCM during the mitigation of a Loss of all AC. The ICCM is powered from DC supplied Instrument Buses and will remain energized for some time following a loss of all AC Power.

D. Incorrect. Parameters are utilized from the ICCM during the mitigation of a Loss of Heat Sink, such as CETC temperatures. However, ICCM is designed primarily for a Small Break LOCA.

ILC-11-2 NRC Exam

Question 68

Tier 3

K/A Importance Rating - RO 3.7 SRO 3.9

Knowledge of system purpose and/or function.

Reference(s) - Sim/Plant design, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - ICCM 001

Question Source - BANK (Not used on an NRC Exam from 2004 to present.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.7

Comments -

MAB Comments:

The wording of this question does not sound right to me. The design function of the ICCM is a SB LOCA? I think what you are trying to test is that the ICCM is designed to monitor for inadequate core cooling during a SB LOCA. I think some modification to the wording of the question and/or answer choices is necessary.

Revised the wording to ask " The ICCM is designed to monitor for inadequate core cooling during a _____.

"C" is not plausible. A steam line break will cool the core - cooling will not be inadequate. **Changed "C" to Loss of All AC Power. The ICCM will remain energized via the station batteries during a loss of all AC.**

69. G2.2.6 001

Which ONE (1) of the following statements applies to the temporary procedure change process IAW PRO-NGGC-0204, PROCEDURE REVIEW AND APPROVAL?

PNSC - Plant Nuclear Safety Committee

- A✓ The expiration date of the temporary change shall not exceed 21 days from the approval date.
- B. Two SROs, one of which is a PNSC member, must approve a temporary change if the revision is a change of intent.
- C. Two SROs, none of which are required to be a PNSC member, must approve a temporary change if the revision is a change of intent.
- D. The expiration date of the temporary change shall not exceed four months from the interim approval date.

The correct answer is A.

A. Correct

B. Incorrect - A temporary change has to be approved by Management personnel, but it does NOT require the Procedure Owner to approve it before use by the shift operators.

C. Incorrect - Temporary Procedure Change Interim Approver at RNP are required to be a member of management AND the Shift Manager or designee with a SRO license. Since two personnel are required for approval of an temporary change the candidate may think that both must hold an SRO license. A temporary procedure change is not allowed for a change of intent. Candidate may think that a change of intent is a special type of temporary procedure change that requires two SROs.

D. Incorrect - Four months is the expiration date for temporary procedure revisions for ALL other Progress Energy sites.

Question 69

Tier 3

K/A Importance Rating - RO 3.0 SRO 3.6

Knowledge of the process for making changes to procedures.

Reference(s) - Sim/Plant design, PRO-NGGC-0204

Proposed References to be provided to applicants during examination - None

Learning Objective - Admin Self Study

Question Source - BANK (Used on the 2008 NRC Exam.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 43.3 / 45.13

Comments - Discussed with P. Capehart on 6/15/11: Discussed concern that RNP does not utilize temporary procedure changes. All procedure changes are performed utilizing the normal process and procedure writers are called out to make necessary changes if conditions warrant. It was agreed to prepare a question to the K/A and if difficulty in preparing plausible distracters becomes evident then this K/A will be re-addressed.

MAB Comments:

What is PI-2089 at Robinson? **Removed from question stem. This was a made up instrument.**

"B" is not plausible. The procedure in question is an AOP. Therefore, the plant is in an abnormal condition - potentially on a backshift. Is it credible to think that the procedure owner would be required to approve the temporary procedure change?

"C" is not plausible for similar reasons. How long does the normal procedure change process take? The plant is in an abnormal condition. Is it reasonable that a typo would prevent the crew from taking care of the plant?

Removed AOP from the stem of the question. Question now simply asks which of the following statements applies to the temporary procedure change process IAW PRO-NGGC-0204.

70. G2.2.7 001

Operations has been scheduled to perform a new Special Test that has been designated as an Infrequently Performed Test or Evolution IAW OPS-NGGC-1315, Conduct of Infrequently Performed Tests or Evolutions (IPTE).

Which ONE(1) of the following completes the statement below?

IAW OPS-NGGC-1315, the _____ is required to designate the IPTE Manager.

- A. Shift Manager
- B. Manager - Shift Operations
- C. Operations Manager
- D✓ Plant General Manager

The correct answer is D.

A. Incorrect - The Shift Manager will be involved in the IPTE and will most likely contact the PGM to determine the IPTE manager. The PGM will designate the IPTE Manager.

B. Incorrect - The Manager - Shift Operations could be involved with requesting an IPTE Manager and could also be designated as the IPTE manager. However, the PGM is required to designate the IPTE Manager.

C. Incorrect - The Operations Manager could be involved with requesting an IPTE Manager and could also be designated as the IPTE manager. However, the PGM is required to designate the IPTE Manager

D. Correct.

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Question 70

Tier 3

K/A Importance Rating - RO 2.9 SRO 3.6

Knowledge of the process for conducting special or infrequent tests.

Reference(s) - Sim/Plant design, OPS-NGGC-1315

Proposed References to be provided to applicants during examination - None

Learning Objective - Admin Self Study

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 43.3 / 45.13

Comments -

MAB Comments:

This type of information is usually tested on the SRO portion of the exam. Is this RO required knowledge at Robinson? Is there an RO learning objective for this information? If this question appears in its current form in the final submittal, then it will be considered as RO knowledge at Robinson. **RO Knowledge.**

No comments on the material aspects of the question.

Question revised to only ask who is required to designate the IPTE Manager.

Result from validation comments.

71. G2.3.13 001

Given the following plant conditions:

- RCS cooldown is in progress IAW GP-007, Plant Cooldown from Hot Shutdown to Cold Shutdown.
- The RCS Filter radiation levels are 1100 mrem/hr at 30 cm from the filter housing.
- You have been assigned by the WCC SRO to hang a clearance on the filter for replacement.

Which ONE (1) of the following identifies

The radiation area is required to be classified as a (1) and the Independent / Concurrent Verification (2) be waived IAW OPS-NGGC-1303, Independent Verification.

A✓ (1) Locked High Radiation Area

(2) can

B. (1) High Radiation Area

(2) can

C. (1) Locked High Radiation Area

(2) cannot

D. (1) High Radiation Area

(2) cannot

The correct answer is A.

A. Correct. Reference AP-031. A LHRA is in excess of 1000 mrem in one hour at 30 cm from the source. IAW OPS-NGGC-1303, IV can be waived if excessive radiation exposures would result to conduct the IV. As a guideline, an exposure of greater than 10 mrem would be considered excessive. If the IV took 1 minute the person performing the IV could received approximately 18 mrem.

B. Incorrect. HRA is >100 mR in 1 hour. The second part of the distractor is correct. See discussion in "A" above.

C. Incorrect. Classification correct. IAW OPS-NGGC-1303, IV can be waived if excessive radiation exposures would result to conduct the IV. As a guideline, an exposure of greater than 10 mrem would be considered excessive. If the IV took 1 minute the person performing the IV could received approximately 18 mrem.

D. Incorrect. Both parts are incorrect. See discussions above. These areas typically not LHRAs, but HRAs.

ILC-11-2 NRC Exam

Question 71

Tier 3

K/A Importance Rating - RO 3.4 SRO 3.7

Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Reference(s) - Sim/Plant design, HPS-NGGC-0003, AP-031.

Proposed References to be provided to applicants during examination - None

Learning Objective - Admin Self Study, Rad. Work Training

Question Source - ILC-09 NRC EXAM

Question Cognitive Level - F

10 CFR Part 55 Content - 41.12 / 43.4 / 45.9 / 45.10

Comments -

MAB Comments:

Nuclear Shift Manager does not appear to contain plausibility for a LHRA entry approval. A normal evolution is occurring and the issue is with high radiation levels. Suggest replacing the approval part. What about equipment verifications in a high dose area – are their alternate methods that can be used to maintain does ALARA?

Question revised as recommended. Question no longer asks who must approve entry. Question now ask the candidate to classify the area and determine if IV/CV can be waived due to the dose concerns.

Question was on the ILC-09 NRC Exam. **Question revised. No longer matches the question from ILC-09 NRC Exam.**

How was this question selected? Have the licensee walk through in detail, the selection process used for this question. **Random.org is more than one question found that matches the K/A.**

NUREG-1021, ES-401, Page 8 of 33, states, “If the bank contains more than one question that fits a specific KA statement, randomly select from among the available questions unless there is an appropriate basis for selecting a specific question (e.g., higher cognitive level, better discrimination validity, more operationally oriented, or site-specific priority).”

72. G2.3.4 001

Which ONE (1) of the following are the correct values for the 10CFR20 Federal Adult Occupational Dose Limits?

	<u>Skin</u>	<u>Lens of Eye</u>
A.	50 rem/yr	5 rem/yr
B.✓	50 rem/yr	15 rem/yr
C.	15 rem/yr	5 rem/yr
D.	15 rem/yr	15 rem/yr

The correct answer is B.

A. Incorrect - Plausible since the lens of eye limit listed is lowest value, which is expected.

B. Correct

C. Incorrect - Plausible since the lens of eye limit listed is the lowest value, which is expected.

D. Incorrect - Plausible because SKIn and Extremities have the same limit of 50 rem/yr. Candidate may confuse this fact and think that Skin and Lens of Eye are the same limit.

ILC-11-2 NRC Exam

Question 72

Tier 3

K/A Importance Rating - RO 3.2 SRO 3.7

Knowledge of radiation exposure limits under normal or emergency conditions.

Reference(s) - Sim/Plant design, DOS-NGGC-0004

Proposed References to be provided to applicants during examination - None

Learning Objective - Admin Self Study, Rad. Worker Training

Question Source - BANK (Not used an NRC Exam from 2004 to present.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.12 / 43.4 / 45.10

Comments -

MAB Comments:

Why are three columns of information included? Only include information in the distractors that is needed to make the answer choices unique. In this case you can completely delete the first column (Extremities) and you still have 4 unique answer choices. The only purpose the extra information serves is to reduce the plausibility of distractors by providing more ways to disqualify the distractors. **Deleted the first column as recommended.**

73. G2.4.25 001

Which ONE (1) of the following identifies the procedure that provides the Incident Commander with detailed method of attack strategies for a fire in the MDAFW Pump Room?

- A. AOP-041, Response to Fire Event
- B. OMM-002, Fire Protection Manual
- C✓ OMM-003, Fire Protection Pre-Plans
- D. APP-044, Fire Alarm Response Manual

The correct answer is C.

A. Incorrect - AOP-041 is a relatively new AOP that provides control room direction on how to address a fire in the plant. However, this procedure does not contain specific attack strategies for specific plant areas.

B. Incorrect - This procedure establishes the responsibilities and methods for implementation of the RNP Fire Protection Program.

C. Correct

D. Incorrect - This procedure provides control room responses for Fire Alarm Console alarms. Does not provide attack strategies for the fire brigade.

Question 73

Tier 3

K/A Importance Rating - RO 3.3 SRO 3.7

Knowledge of fire protection procedures.

Reference(s) - Sim/Plant design, AOP-041, OMM-002, OMM-003, APP-044

Proposed References to be provided to applicants during examination - None

Learning Objective - OMM-003-003

Question Source - BANK (Last used on 2004 NRC Exam.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 43.5 / 45.13

Comments - K/A match because candidate must know that OMM-003 provides the plans and strategies for safe and effective fire suppression by the Unit 2 Fire Brigade and offsite fire companies.

Reviewed and approved by MAB.

74. G2.4.39 001

Given the following plant conditions:

- Plant was at 100% RTP.
- At time 1205 a Reactor Trip and several events occurred.
- At time 1215 an ALERT is declared by the CR-SEC.
- At time 1225 the Emergency Notification Form is completed and approved by the CR-SEC.

Which ONE(1) of the following identifies the **LATEST** time that the initial notification to the State and County officials is due?

- A. 1220
- B✓ 1230
- C. 1235
- D. 1240

The correct answer is B.

A. Incorrect. This is the time at which the declaration must be made by the CR-SEC.

B. Correct.

C. Incorrect. The CR-SEC has 15 minutes to declare the event and then 15 minutes from declaration to notify the state and counties. This theoretically gives the CR-SEC 30 minutes to make a notification. However, since the declaration was made at 1215 the notification must be made by 1230. This distractor is based on 30 minutes from 1205.

D. Incorrect. This distractor is based on 15 minutes incorrectly added to the time the ENF form was completed and approved. The notification must be made within 15 minutes of the event declaration.

Question 74

Tier 3

K/A Importance Rating - RO 3.9 SRO 3.8

Knowledge of RO responsibilities in emergency plan implementation.

Reference(s) - Sim/Plant design, EPNOT-01, EPCLA-01

Proposed References to be provided to applicants during examination - None

Learning Objective - Emergency Communicator Qualification

Question Source - BANK (Used on the 2007 NRC Exam.)

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 45.11

Comments -

75. G2.4.9 001

Given the following plant conditions:

- Plant cooldown is in progress. RCS Temperature is at 290°F.
- Excessive leakage has been identified in "C" RCP Bay.
- "A" RHR pump is providing decay heat removal.
- RCS letdown has been isolated.
- Two charging pumps are running at maximum speed.
- PZR level is 12% and lowering.
- RCS subcooling is 40°F.

Which ONE (1) of the following completes the statement below?

IAW AOP-033, Shutdown LOCA, the **NEXT** step required to be performed for mitigation strategy is to

- A. check SI Pump Suction Line to RWST - ANY REASON TO BELIEVE STEAM BOUND.
- B✓ start the remaining Charging Pump and raise speed to maximum.
- C. verify available SI Pump Breakers - RACKED IN
- D. stop "A" RHR Pump.

The correct answer is B.

A. Incorrect - If all three charging pumps were running at maximum speed with the indications given then this would be the correct answer.

B. Correct - AOP-033, Step 8, has the operator to check all charging pumps running at full speed if PZR level is lowering and letdown is isolated.

C. Incorrect - SI pump breakers are verified racked in once the SI pump suction line to RWST has been verified to not to be steam bound. AOP-016 directs the crew to trip the reactor and go to PATH-1 if PZR level cannot be maintained with two charging pumps at maximum speed and letdown isolated. This makes starting a SI pump a plausible distractor.

D. Incorrect - "A" RHR pump would be stopped if PZR level is less than 10% or RCS subcooling is less than 35°F. These conditions are not met, however, PZR level is continuing to lower.

Question 75

Tier 3

K/A Importance Rating - RO 3.8 SRO 4.2

Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

Reference(s) - Sim/Plant design, AOP-033

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-033-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.13

Comments -

MAB Comment: How would the operators know that there were no indications that the leak was in the RHR system? No sump/rad alarms in aux bld would not tell the entire story? I just want to ensure that the conditions provided are operationally valid to place them in the right procedure location to support the correct answer.

Removed the statements that a LOCA had occurred and CV pressure elevated from the stem. Revise bullet to state that "A" RHR pump is providing decay heat removal vice core cooling. Also removed the statement "There is no indication of a rupture in the RHR System." Added "Excessive leakage has been identified in "C" RCP Bay" to the stem of the question. This statement means that the leakage would be downstream of the RHR-744s which are located outside the missile barrier.

Bolded the word "NEXT" in the stem of the question. Result of validation comments.

76. 038 EG2.4.11 SRO 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- The crew is implementing AOP-035, S/G Tube Leak, due to an identified tube leak in "B" S/G.
- Two charging pumps are running at maximum output and all letdown flowpaths have been isolated.
- RO reports that PZR Level is at 22% and continuing to lower in an uncontrolled manner.

Which ONE (1) of the following is the proper procedural progression for the given conditions?

EPP-7, SI Termination

EPP-12, Post-SGTR Cooldown Using Backfill

- A. ✓ Trip the Reactor --> Manual SI --> PATH-1 --> PATH-2 --> EPP-12
- B. Trip the Reactor --> Manual SI --> PATH-1 --> PATH-2 --> EPP-7 --> EPP-12
- C. Continue in AOP-035 --> Trip the Reactor and actuate SI when PZR level reaches 10% --> PATH-1 --> PATH-2 --> EPP-12
- D. Continue in AOP-035, start the remaining charging pump and raise speed to maximum and monitor PZR level.

The correct answer is A.

A. Correct.

B. Incorrect. EPP-7 is not entered for a tube rupture. PATH-2 and EPP-12 will provide direction on when to secure SI pumps and resetting of ECCS components.

C. Incorrect. Foldout "A" does contain requirements to actuate SI if PZR Level cannot be maintained greater than 10%. AOP-035 does not provide this direction. AOP-035 requires that the reactor be tripped if RCS level is lowering uncontrollably with two charging pumps at maximum speed and letdown isolated.

D. Incorrect. This was the correct process up to a few years ago. In the past the third charging pump was started and taken to maximum speed after letdown was isolated. This was removed during a recent revision as a prudent action to trip the reactor with only two charging pumps running at maximum speed and letdown isolated.

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Question 76

Tier/Group 1/1

K/A Importance Rating - RO 4.0 SRO 4.2

Steam Generator Tube Rupture: Knowledge of abnormal condition procedures.

Reference(s) - Sim/Plant design, AOP-035, PATH-1/2, EPP-12, EPP-7

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-035-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.13

Comments - Discussed with P. Capehart on 6/15/11: Knowledge of abnormal condition procedures relative to a SGTR. At RNP a SGTR is mitigated utilizing the EOP network procedures. A S/G Tube Leak is mitigated using an AOP. Agreed that "abnormal condition procedures" also included the EOP network procedures

SRO: Assessing plant conditions and then selecting a procedure or section of a procedure to mitigate, recover, or which to proceed.

77. 054 AG2.4.11 SRO 001

Given the following plant conditions:

Initial Conditions:

- The plant is at 100% RTP.
- OST-010, Power Range Calorimetric During Power Operation Daily, was performed at 1000 hours.

Current Conditions:

- FWUFM declared out of service at 1300 hours.
- A feedwater flow transient has occurred.
- HCV-1459, LP Heaters Bypass Valve, is observed to be OPEN with its control switch in AUTO.
- Main Feedwater Pump suction pressure is currently 375 psig.

Which ONE (1) of the following completes the statements below?

IAW OMM-001-2, Shift Routines and Operating Practices, Reactor Thermal Power is limited to a maximum of (1) MWth briefly power excursions.

AOP-010, Main Feedwater/Condensate Malfunction, (2) contain steps to reduce power.

A. (1) 2346 MWth

(2) does

B. (1) 2339 MWth

(2) does

C. (1) 2339 MWth

(2) does NOT

D. (1) 2346 MWth

(2) does NOT

The correct answer is A.

A. Correct.

B. Incorrect. With HCV-1459 open the feedwater will become cooler due to bypassing the LP FW Heaters. This will cause reactor power to increase. 2339 is 100% RTP when FWUFM is in service. This is the power level that the operators attempt to maintain. With FWUFM OOS the operators will have to control power to a maximum of 2300 MWth when it has been OOS longer than allowed by TRM 3.25. During steady-state operations the 8 hour average power is required to 2339 MWth or less. If a valid calorimetric Power Alarm is received, reactor power is required to be reduced to less than 2339 MWth. The second part of the distractor is correct.

C. Incorrect. See "B" above for discussion concerning 2339 MWth. AOP-010 does direct the operators to control reactor power to less than 100%. Power will be lowered so that MFP suction pressure is greater than 400 psig. At 400 psig MFP suction pressure HCV-1459 should automatically open with the control switch in AUTO. In the past, ~ 6 years ago, directions to control power were added to the AOPs so that OP-105 would not have to be entered everytime a power reduction was required.

D. Incorrect. With HCV-1459 open the feedwater will become cooler due to bypassing the LP FW Heaters. This will cause reactor power to increase. OMM-001-2 does allow for power excursions to occur for short periods of time as long as the absolute maximum RTP of 2346 MWth is not exceeded. (102% of 2300MWth is 2346MWth) AOP-010 does direct the operators to control reactor power to less than 100%. Power will be lowered so that MFP suction pressure is greater than 400 psig. At 400 psig MFP suction pressure HCV-1459 should automatically open with the control switch in AUTO. In the past, ~ 6 years ago, directions to control power were added to the AOPs so that OP-105 would not have to be entered everytime a power reduction was required.

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Question 77

Tier/Group 1/1

K/A Importance Rating - RO 4.0 SRO 4.2

Loss of Main Feedwater (MFW): Knowledge of abnormal condition procedures.

Reference(s) - Sim/Plant design, AOP-010, OMM-001-2

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-010-006

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.13

Comments -

SRO: Assessing plant conditions and then selecting a section of a procedure to mitigate, recover, or with which to proceed. Also knowledge of maximum licensed thermal power limitations.

RAB Comments:

Why is 2385 MWth plausible? What documents refer to 2385 MWth? No documentation was provided to justify its plausibility. (I am assuming 102% of rated?) There may be two acceptable options: (1) To enhance plausibility, consider making UFGMs out of service and iterate on 2346 MWth and 2300 MWth. OR (2) provide supporting documentation for the plausibility of 2385 MWth. **Removed 2385 MWth. Replaced with 2339 and revised the question stem to ask what is the maximum allowed Reactor Thermal Power for short power excursions.**

Why is OP-105 an incorrect choice? I see no explanation or documentation with the question that supports OP-105 being incorrect. Consider iterating on (1) AOP-10 contains steps to reduce power. AND (2) AOP-10 does not contain steps to reduce power. **Revised as recommended. Question now asked whether or not AOP-010 contains steps to reduce power.**

The last sentence in the analysis of answer choice B does not appear to be correct. It states that 2385 MWth is correct – yet the correct answer has 2346 MWth as correct. **Typo. 2385 no longer is part of the answers.**

Knowledge of max licensed power limits is RO knowledge – after all the ROs are operating the plant. **Agreed.**

Made "FWUFGM out of service." a separate bullet in the stem of question. Also changed "allow to increase" to "limited". Comments from exam validation.

78. 055 EA2.01 SRO 001

Given the following plant conditions:

- GP-007, Plant Cooldown From Hot Shutdown to Cold Shutdown is in progress.
- RCS temperature is 225°F with RHR Pump "A" in service.
- At time 1500 the SUT has failed and both EDGs have tripped.
- At time 1520 efforts to restore power are still in progress.

Which ONE (1) of the following completes the statement below?

FCV-605 and HCV-758 will fail (1) and the Emergency Action Level required to be declared IAW the EAL Matrices is a(n) (2).

FCV-605, RHR HX BYPASS FLOW
HCV-758, RHR HX DISCH FLOW

(Reference Provided)

A. (1) SHUT

(2) Alert

B. (1) OPEN

(2) Alert

C. (1) OPEN

(2) Site Area Emergency

D✓ (1) SHUT

(2) Site Area Emergency

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The correct answer is D.

- A: Incorrect - Both FCV-605 and HCV-758 fail SHUT on loss of IA. A SAE will be declared since the plant is still in Mode 4 and power not restored within 15 minutes. If candidate uses the Cold Conditions matrix then the Alert is a plausible answer.
- B: Incorrect - Both FCV-605 and HCV-758 fail SHUT on loss of IA. A SAE will be declared since the plant is still in Mode 4 and power not restored within 15 minutes. If candidate uses the Cold Conditions matrix then the Alert is a plausible answer.
- C: Incorrect - Both FCV-605 and HCV-758 fail SHUT on loss of IA. Second part of distractor is correct.
- D: Correct -

Question 78

Tier/Group 1/1

K/A Importance Rating - RO 3.4 SRO 3.7

Ability to determine or interpret the following as they apply to a Station Blackout:
Existing valve positioning on a loss of instrument air system.

Reference(s) - Sim/Plant design, AOP-017, Pages 3 and 36; SD-003, RHR, Figure 3., OMM-022.

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-017-006

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 43.5 / 45.13

Comments -

SRO: The candidate must have knowledge of administrative procedures that specify hierarchy, implementation, and/or coordination of plant normal, abnormal, and emergency procedures. OMM-022, Emergency Operating Procedures User's Guide, contains the instructions for the use of Emergency and Abnormal Operating Procedures.

MAB Comments:

KA/SRO-only: The KA is not met at the SRO level. EPP-1 is a major EOP as defined in the SRO guidance. RO knowledge can be used to know that EPP-1 does not apply.

Knowing failure modes for a valve is RO knowledge. **Removed procedure entry portion of question and replaced with e-plan question.**

Could e-plan be used to hit the KA at the SRO level? **Revised the question to have candidate determine the EAL action level. Revised stem of question to provide necessary information to properly utilize the EAL matrices. Candidate must recognize that even though a cooldown to cold shutdown is in progress the plant is still in Mode 4 and the Hot Conditions Matrix applies.**

How does the question map through the SRO guidance document?

79. 058 AA2.03 SRO 001

The plant was operating at 100% RTP when the following occurs:

- "B" DC Bus has de-energized.
- EPP-27, Loss of DC Bus "B", has been entered.
- The batteries and the in-service battery charger are determined to be damaged.

Which ONE (1) of the following completes the statements below?

OCBs 52/8 AND 52/9 (1) .

Within four hours of the failure the standby battery charger is aligned to energize the bus to nominal voltage. IAW ITS 3.8, Electrical Power Systems, operability of the bus (2) restored.

A✓ (1) must be locally tripped

(2) is NOT

B. (1) must be locally tripped

(2) is

C. (1) will trip on Generator Lockout

(2) is NOT

D. (1) will trip on Generator Lockout

(2) is

The correct answer is A.

A. Correct. The OCBs must be locally tripped by a maintenance crew. The DC bus is not operable. In Modes 1 - 4, for a DC Bus to be considered operable the battery and at least one battery charger must be operable. In Modes 5 and 6 a DC Bus is considered operable with either the battery OR a battery charger. The ITS section for Modes 5 and 6 is titled 3.8.5 DC Sources - Shutdown.

B. Incorrect - The first half of answer is correct. The second half is incorrect. The DC bus is not operable. In Modes 1 - 4, for a DC Bus to be considered operable the battery and at least one battery charger must be operable. In Modes 5 and 6 a DC Bus is considered operable with either the battery OR a battery charger. The ITS section for Modes 5 and 6 is titled 3.8.5 DC Sources - Shutdown. Candidate may think this section applies since the plant is shutdown.

C. Incorrect - The first half is incorrect. A generator lockout will be received but cannot open the OCBs due to the loss of their control power. The second half of distractor is correct.

D. Incorrect. The first half is incorrect. A generator lockout will be received but cannot open the OCBs due to the loss of their control power. The DC bus is not operable. In Modes 1 - 4, for a DC Bus to be considered operable the battery and at least one battery charger must be operable. In Modes 5 and 6 a DC Bus is considered operable with either the battery OR a battery charger. The ITS section for Modes 5 and 6 is titled 3.8.5 DC Sources - Shutdown. Candidate may think this section applies since the plant is shutdown.

Question 79

Tier/Group 1/1

K/A Importance Rating - RO 3.5 SRO 3.9

Ability to determine and interpret the following as they apply to the Loss of DC Power:
DC loads lost; impact on ability to operate and monitor plant systems

Reference(s) - Sim/Plant design, EPP-4/7, EPP-27, Foldout H

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-27-002

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 43.5 / 45.13

Comments -

SRO: Assessing plant conditions and then selecting a procedure or section of a procedure to mitigate, recover, or with which to proceed. Candidate must also demonstrate knowledge of the content of the procedure.

MAB Comments:

SRO-only: If the plant conditions do not result in an SI, then using RO knowledge, the applicant would conclude that EPP-7 is not a valid answer choice. Then system response knowledge is the only thing needed to analyze the second part of the answer choices also. **Revised the question to ask if the OCBs must be locally tripped or will automatically trip with a loss of DC Bus "B". Then the candidate is asked to determine the operability of the bus with a return of the standby battery charger. SRO knowledge is required to determine operability based on knowledge of the ITS bases document.**

How does the question map through the SRO guidance document?

80. W/E 04 EG2.4.3 SRO 001

The Plant has experienced a LOCA Outside of Containment and the crew has implemented PATH-1 and transitioned to EPP-20, LOCA Outside Containment.

Which ONE (1) of the following completes the statements below?

If ALL of the instruments were operable, (1) are the Reg. Guide 1.97 instruments **that would be utilized by EPP-20 to diagnose and mitigate** the accident.

Given the values listed for each instrument, the conditions of ITS LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation are (2).

PI-455, PZR Pressure	- 1750 psig and lowering
PI-456, PZR Pressure	- 1725 psig and lowering
PI-457, PZR Pressure	- Failed LOW
PI-511AA, RCS Wide Range Pressure	- 1750 psig and lowering
PI-511BA, RCS Wide Range Pressure	- 1750 psig and lowering
PI-402, RCS Wide Range Pressure	- 1725 psig and lowering
PI-501, RCS Wide Range Pressure	- Failed LOW
LT-459, PZR Level Transmitter	- 5% and lowering
LT-460, PZR Level Transmitter	- 5% and lowering
LT-461, PZR Level Transmitter	- 5% and lowering

(REFERENCE PROVIDED)

- A. (1) PI-455, 456, 457, 402, 501, LT-459, 460, 461 (**NOT** PI-511AA, 511BA)
(2) NOT met
- B. (1) PI-455, 456, 457, 402, 501 (**NOT** LT-459, 460 , 461, PI-511AA, 511BA)
(2) NOT met
- C✓ (1) PI-511AA, 511BA, 402, 501 (**NOT** LT-459, 460 , 461, PI-455, 456, 457)
(2) met
- D. (1) PI-511AA, 511BA, LT-459, 460 , 461 (**NOT** PI-455, 456, 457, 402, 501)
(2) met

The correct answer is C.

A. Incorrect. PI-455,456,457 are not Reg. Guide 1.97 instruments. EPP-20 only uses pressure indication only as a means of diagnosis and mitigation for LOCA Outside Containment. As sections of systems are isolated RCS pressure is monitored to see if a rising trend is observed. Plausible if the candidate thinks that PI-402 and PI-501, which are Reg Guide 1.97, are the instruments credited for in ITS 3.3.3. The bases for ITS 3.3.3 states that the RCS Pressure (Wide Range) instruments are the indications from the Inadequate Core Cooling Monitor. PI-402 and PI-501 are not part of the ICCM and are therefore not credited in ITS 3.3.3.

B. Incorrect. See discussion A above.

C. Correct. PI-511AA, 511BA, 402 and 501 are the only Reg. Guide 1.97 instruments listed in the stem of the question. EPP-020 only uses RCS pressure as an indication to determine if actions to isolate the LOCA have been successful. ITS LCO 3.3.3 requires that 2 RCS Wide Range Pressure instruments be operable. The bases for ITS 3.3.3 states that the RCS Pressure (Wide Range) instruments are the indications from the Inadequate Core Cooling Monitor. PI-402 and PI-501 are not part of the ICCM and are therefore not credited in ITS 3.3.3.

D. Incorrect. See distractor A discussion. The second half of the distractor is correct.

Question 80

Tier/Group 1/1

K/A Importance Rating - RO 3.7 SRO 3.9

LOCA Outside Containment: Ability to identify post-accident instrumentation.

Reference(s) - Sim/Plant design, EPP-20, OMM-007, TMM-026, ITS LCO 3.3.3 and bases.

Proposed References to be provided to applicants during examination - ITS 3.3.3

Learning Objective -EPP-20-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.6 / 45.4

Comments - K/A match because candidate must know which instruments listed are utilized in EPP-20 and what the requirements are for PAM instrumentation operability.

SRO: Candidate must demonstrate knowledge of TS bases that is required to analyze TS required actions and terminology. The TS bases is the only document that specifies that the Wide Range Pressure indication on the ICCM are the ITS 3.3.3 credited RCS pressure indications.

**Revise stem of the question to add "If ALL of the instruments were operable".
Made the stem of the question two separate questions. Revision based on validation comments.**

81. W/E 05 EA2.1 SRO 001

Given the following plant conditions:

- Plant is operating at 100% RTP.
- A seismic event results in a rupture of the common AFW suction line to all AFW pumps coincident with a break in the RCS piping.
- Containment pressure reached 4.2 psig and is currently 3.5 psig and lowering.
- The crew has transitioned from PATH-1 to FRP-H.1, Response to Loss of Secondary Heat Sink.
- RCS temperature is 360°F and pressure is 275 psig.
- S/G conditions:

<u>S/G</u>	<u>Level (WR)</u>	<u>Pressure</u>
A	42%	800 psig
B	44%	810 psig
C	44%	810 psig

Which ONE (1) of the following completes the statement below?

For the conditions given above, a heat sink (1) required. The required procedural progression would be to (2).

A. (1) is NOT

(2) transition to PATH-1, Entry Point A

B✓ (1) is NOT

(2) transition to PATH-1, Entry Point C

C. (1) is

(2) remain in FRP-H.1

D. (1) is

(2) transition to Supplement I, Aligning RHR System for Core Cooling Mode

The correct answer is B.

A. Incorrect. The first part is correct. Based on given conditions a LOCA has occurred and a Heat Sink is not required. FRP-H.1 will direct the crew to PATH-1, Entry Point C since RCS pressure is not greater than any non-faulted steam generator. Entry Point A is a standard re-entry point to PATH-1 if an incorrect transition is made while in PATH-1.

B. Correct.

C. Incorrect. Heat sink is not required due to RCS pressure less than all non-faulted S/G pressures. Candidate may not remember this requirement and feel that remaining in FRP-H.1 is higher priority.

D. Incorrect. Heat sink is not required due to RCS pressure less than all non-faulted S/G pressures. FRP-H.1 does have a requirement to transition to Supplement I if RCS temperature is less than 350°F. However, this step would not be reached since the LOCA has a higher priority and a heat sink is not required.

Question 81

Tier/Group 1/1

K/A Importance Rating - RO 3.4 SRO 4.4

Ability to determine and interpret the following as they apply to the (Loss of Secondary Heat Sink): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Reference(s) - Sim/Plant design, FRP-H.1, OMM-022

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-H.1-001, -004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 43.5 / 45.13

SRO: The candidate must assess the given plant conditions during the emergency given and then determine if a given section is applicable. This is equivalent to the knowledge of diagnostic steps and decision points in the EOP network that involves transitions to event specific sub-procedures or emergency contingency procedures.

MAB Comments:SRO-only: Red path procedure entry is RO knowledge. Mitigating strategy is RO knowledge. No SRO level procedure selection is tested in the question. Part of the H.1 strategy is to limit heat input to the RCS – I.E. stop RCPs. Testing details of a procedure is not SRO knowledge. Details of a procedure could only be SRO only knowledge if that information is needed to make a procedure selection. In this case, stopping an RCP is not a procedure selection – it is a single action that also happens to be part of the overall mitigating strategy. **Revised the question to have a seismic event result in a loss of the common AFW suction line, included RCS temperature and pressure and S/G pressures. Question now asks whether or not a heat sink is required and the procedural progression.**

How did this question map through the SRO guidance document?

82. W/E 015 EG2.1.32 SRO 001

Given the following plant conditions:

- A seismic event has lead to a LOCA and rupture of SW piping to all HVH units in containment.
- PATH-1 completed to the point of transition to another procedure.
- Only one train of CV Spray is operating properly.
- The following conditions exist in Containment:
 - Containment Pressure is 24 psig and rising.
 - Containment Sump Level is 385 inches and rising.

Which ONE (1) of the following completes the statement below?

Based on the current conditions, containment (1) is the highest priority and the basis for this is (2).

A. (1) pressure

(2) one train of CV Spray cannot maintain pressure below the containment design pressure

B. (1) pressure

(2) due to containment pressure being greater than 10 psig with limited Containment Cooling

C✓ (1) sump level

(2) potential flooding of critical systems and components needed for future plant recovery may occur

D. (1) sump level

(2) dilution of sump water with SW may potentially cause a return to criticality

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The correct answer is C.

A. Incorrect. As long as one train of CV spray is operating containment pressure will not become the top priority until pressure reaches 42 psig. Since above 10 psig, the operator is sent to a section in the CSFSTs that verifies adequate spray flow.

B. Incorrect. As long as one train of CV spray is operating containment pressure will not become the top priority until pressure reaches 42 psig. Since above 10 psig, the operator is sent to a section in the CSFSTs that verifies adequate spray flow.

C. Correct.

D. Incorrect. The first half of distractor is correct. The basis for FRP-J.2, Containment Flooding, does NOT address reactivity as a concern. The rupture of SW will cause a dilution of the CV Sump water. The basis for a fire water rupture does address dilution of sump water in the CV following a LOCA.

Question 82

Tier/Group 1/1

K/A Importance Rating - RO 3.8 SRO 4.0

Containment Flooding: Ability to explain and apply system limits and precautions.

Reference(s) - Sim/Plant design, CSFST, FRP-J.1 / J.2, FRP-J.2BD

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-J.2-002, --3

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.2 / 45.12

SRO: Candidate must know the hierarchy of the Critical Safety Function Status Trees with respect to containment parameters. Candidate must also know the bases for this functional restoration procedure.

MAB Comments:

Prior to the STA reporting to the control room, who is responsible for monitoring safety function status trees? Where are these responsibilities defined in administrative procedures? At most plants, monitoring of safety functions is RO required knowledge. Does Robinson have an SRO-learning objective for knowing the hierarchy of safety functions? **IAW OMM-022 the CRS is the designated primary SPDS user while the STA is available to assist.**

Does Robinson require their operators to have Orange Path FRPs committed to memory? **YES**

I see no supporting documentation to justify the second part of the answer choices. Before this question can be rated as satisfactory, I will need to see documentation that justifies plausibility and incorrectness of distractors as well as the correctness of the answer. The basis for the prioritization potentially could be used to justify SRO-only because the guidance document is silent on EOP basis information. **AOP-032 Bases document states that a firewater rupture in the CV represents an unanalyzed condition that would dilute LOCA water before a sump recirc condition. Revise B(2) so that it will be different from A(2) and is based on a misinterpretation of the Containment CSF.**

83. 037 AG2.4.41 SRO 001

Given the following plant conditions:

- The plant is at 100% RTP.
- A tube leak is identified in "C" S/G.
- Two charging pumps running at maximum speed are able to control and stabilize PZR level with one 45 gpm letdown orifice in service.
- Total RCP Seal Leakoff flow is 7.5 gpm.

Which ONE (1) of the following completes the statement below?

The required action to address this condition is to (1) and EAL Classification for this event is (2).

AOP-035, S/G Tube Leak

GP-006-1, Normal Plant Shutdown from Power Operation to Hot Shutdown.

(REFERENCE PROVIDED)

- A. (1) Shutdown the plant IAW GP-006-1 while concurrently performing AOP-035
(2) Unusual Event SU6.1, RCS leakage
- B✓ (1) Shutdown the plant IAW GP-006-1 while concurrently performing AOP-035
(2) Alert FA1.1, Any loss or any potential loss of either Fuel Clad or RCS
- C. (1) Perform AOP-035, Attachment 1, Local S/G Isolation, on "C" S/G and then commence a plant shutdown IAW GP-006-1
(2) Unusual Event SU6.1, RCS leakage
- D. (1) Perform AOP-035, Attachment 1, Local S/G Isolation, on "C" S/G and then commence a plant shutdown IAW GP-006-1
(2) Alert FA1.1, Any loss or any potential loss of either Fuel Clad or RCS

The correct answer is B.

A. Incorrect. The first half of distractor is correct. The EAL classification is incorrect because the leak rate given is greater than the capacity of one charging pump. A UE would be valid up to primary to secondary leak rate of 77 gpm.

B. Correct.

C. Incorrect. Isolation of the S/G is not a prerequisite to commencing the plant shutdown. However in some cases the crew may progress through AOP-035 S/G isolation prior to actually starting the shutdown. The EAL classification is incorrect because the leak rate given is greater than the capacity of one charging pump. A UE would be valid up to primary to secondary leak rate of 77 gpm.

D. Incorrect. Isolation of the S/G is not a prerequisite to commencing the plant shutdown. However in some cases the crew may progress through AOP-035 S/G isolation prior to actually starting the shutdown. The second half of the distractor is correct.

Leak Rate = 154 gpm - 52.5 gpm = 101.5 gpm

154 gpm is two charging pumps at maximum speed.

52.5 gpm is 45 gpm letdown orifice plus 7.5 gpm total leakoff flow.

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Question 83

Tier/Group 1/2

K/A Importance Rating - RO 2.9 SRO 4.6

Steam Generator Tube Leak: Knowledge of the emergency action level thresholds and classifications.

Reference(s) - Sim/Plant design,

Proposed References to be provided to applicants during examination - EAL Matrix

Learning Objective - AOP-035-004, EAL 004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.11

Comments -

SRO: Candidate must know the proper procedure progression for the given condition and requires that an EAL classification be properly determined.

MAB Comments:

Do Robinson procedures actually allow a SG to be isolated prior to shutting down? If a SG is isolated at 100% power, how would the plant respond? My guess is that isolating the C SG at 100% power would result in a trip. Therefore, the first part of C and D are not plausible unless the licensee can provide sufficient justification for plausibility. **The isolation that is discussed in AOP-035 is local isolation of various paths that would not result in a complete isolation of the S/G.**

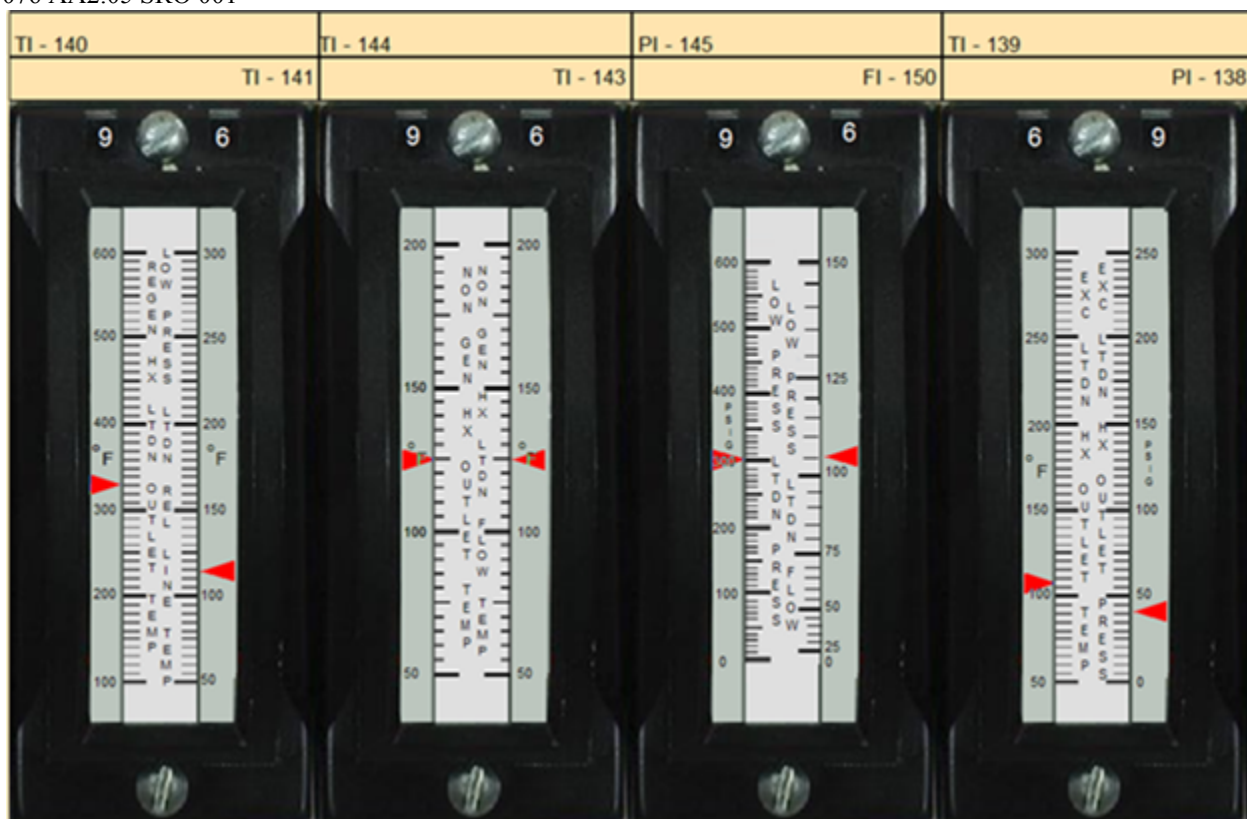
Have the licensee show the leakrate calc that results in greater than 77 gpm leakage.

Leak Rate = 154 gpm - 52.5 gpm = 101.5 gpm

154 gpm is two charging pumps at maximum speed.

52.5 gpm is 45 gpm letdown orifice plus 7.5 gpm total leakoff flow.

84. 076 AA2.05 SRO 001



- Plant is stable at 100% RTP.
- R-9, Letdown Line Area, radiation monitor had a valid alarm and a reading of 15,000 mrem/hr prior to R-9 failing.
- RCS samples indicate an RCS Activity of 550 $\mu\text{Ci/gm}$ I-131 Dose Equivalent.

Which ONE(1) of the following completes the statement below?

IAW AOP-005, Radiation Monitoring System, letdown flow (1) and IAW the Emergency Action Level Matrices, an (2) must be declared.

(REFERENCE PROVIDED)

- A. (1) may remain as-is
(2) Unusual Event
- B. (1) may remain as-is
(2) Alert
- C. (1) is required to be reduced
(2) Unusual Event
- D✓ (1) is required to be reduced
(2) Alert

The correct answer is D.

A. Incorrect. The given letdown flow reading is indicative of one 60 gpm and one 45 gpm letdown orifices being in service. AOP-005 requires that letdown be reduced to less than or equal to one letdown orifice valve open. Therefore, letdown flow is required to be reduced. The second part is incorrect. The candidate may confuse the 550 $\mu\text{Ci/gm}$ I-131 Dose Equivalent reading as being greater than a R-9 reading of 500 mrem/hr on the EAL Matrix for an Unusual Event. The activity reading exceeds the 300 $\mu\text{Ci/gm}$ I-131 Dose Equivalent limit for a loss of the Fuel Cladding Barrier which results in meeting the Alert declaration criteria.

B. Incorrect. The given letdown flow reading is indicative of one 60 gpm and one 45 gpm letdown orifices being in service. AOP-005 requires that letdown be reduced to less than or equal to one letdown orifice valve open. Therefore, letdown flow is required to be reduced. The second part of distractor is correct.

C. Incorrect - The given letdown flow reading is indicative of one 60 gpm and one 45 gpm letdown orifices being in service. AOP-005 requires that letdown be reduced to less than or equal to one letdown orifice valve open. Therefore, letdown flow is required to be reduced. The candidate may confuse the 550 $\mu\text{Ci/gm}$ I-131 Dose Equivalent reading as being greater than a R-9 reading of 500 mrem/hr on the EAL Matrix for an Unusual Event. The activity reading exceeds the 300 $\mu\text{Ci/gm}$ I-131 Dose Equivalent limit for a loss of the Fuel Cladding Barrier which results in meeting the Alert declaration criteria.

D. Correct

Question 84

Tier/Group 1/2

K/A Importance Rating - RO 2.2 SRO 2.5

Ability to determine and interpret the following as they apply to the High Reactor
Coolant Activity: CVCS letdown flow rate indication

Reference(s) - Sim/Plant design,

Proposed References to be provided to applicants during examination - EAL Matrix

Learning Objective - AOP-005-004, EAL 004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 43.5 / 45.13

Comments -

SRO: Candidate must make an EAL Declaration, which is an SRO function.

85. W/E 09 EA2.1 SRO 001

Given the following plant conditions:

Initial Conditions

- A loss of off-site power and reactor trip has occurred.
- A rupture in the Instrument Air System has resulted in Instrument Air pressure lowering to 20 psig.
- The crew performed actions of PATH-1 and has transitioned to EPP-4, Reactor Trip Response.

Current Conditions after 15 minutes

- CETC temperature is 555°F and rising.
- S/G pressure is 1075 psig and rising.

Which ONE (1) of the following completes the statements below?

RCS Natural Circulation (1) exist.

In the situation described above, **detailed** steps for restoration of RCS temperature control will be provided in (2) .

A. (1) does

(2) AOP-017, Loss of Instrument Air

B. (1) does

(2) EPP-4, Reactor Trip Response

C. (1) does NOT

(2) EPP-4, Reactor Trip Response

D✓ (1) does NOT

(2) AOP-017, Loss of Instrument Air

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Correct answer is D.

A. Incorrect. NC does not exist with Tave at 555°F and S/G pressures at 1185 psig. Also, nitrogen must be manually aligned to S/G PORVs on a loss of air.

B. Incorrect. NC does not exist. AOP-017 provides the procedural direction on how to control S/G pressure and RCS temperature on a loss of instrument air. AOP-017 is a concurrent use procedure.

C. Incorrect. Nitrogen must be manually aligned to S/G PORVs on a loss of Air in accordance with AOP-017.

D. Correct.

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Question 85

Tier/Group 1/2

K/A Importance Rating - RO 3.1 SRO 3.8

Ability to determine and interpret the following as they apply to the (Natural Circulation Operations): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Reference(s) - Sim/Plant design, Supplement E, AOP-017, EPP-4, EPP-5

Proposed References to be provided to applicants during examination - None

Learning Objective - EPP-5-004

Question Source - BANK (Last used on 2007 NRC Exam. Format of question modified significantly.)

Question Cognitive Level - H

10 CFR Part 55 Content - 43.5 / 45.13

Comments -

SRO: Candidate must have knowledge of when to implement attachments within abnormal / emergency procedures. Candidate must know that the steps to control RCS temperature using nitrogen aligned to the S/G PORVs is contained in AOP-017 and not EPP-4. Procedure selection and knowledge of procedure content versus knowledge of procedure mitigation strategy.

MAB Comments:

The display of information is a little confusing. The second to last bullet states that it is 15 minutes after the trip. Is the last bullet also 15 minutes after the trip? The second bullet lists conditions after the trip, yet the third bullet list conditions at the time of trip. To clarify, consider providing sets of conditions at various times – like INITIAL CONDITIONS, then CURRENT CONDITIONS. **Revised as recommended.**

In this case, I believe that procedure selection is being tested in that direction for controlling temperature is found in both procedures. The applicant must know more than just one action and the applicant must know more than the mitigation strategy. Also, more than just entry conditions for the AOP and major EOPs are needed.

The KA must be met at the SRO level. The KA requires selection of procedures for natural circ. How is the procedure selection in the form of temperature control associated with natural circ. It seems like the procedure selection may just be associated with a loss of air. Discuss with licensee to enhance my understanding.

AOP-017 is a concurrent use procedure that will be performed along with EPP-4. AOP-017 contains the detailed steps on how to control RCS temperature. EPP-4 provides the broad procedure guidance. Bleeding of steam is needed to start natural circulation.

Revised stem of question to read as follows: "In the situation described above, detailed steps for restoration of RCS temperature control will be provided in (2) ." Comments from exam validation.

86. 003 A2.03 SRO 001

Given the following plant conditions:

Initial Conditions:

- Plant is operating at 100% RTP.
- "A" RCP Motor Upper Thrust Bearing temperature indicates 230°F.
- "C" RCP Motor Upper Guide Bearing temperature indicates 205°F.

Current Conditions:

- RTBs open.
- S/G Levels within normal band.
- Pressurizer pressure is normal.

Which ONE (1) of the following correctly describes whether RCPs "A" and/or "C" are required to be shutdown and whether the conditions of LCO 3.4.5, RCS Loops - Mode 3, are met?

A. Both "A" and "C" RCPs are required to be secured.

Conditions of LCO 3.4.5 met.

B. "A" RCP is required to be secured. "C" RCP is NOT required to be secured.

Conditions of LCO 3.4.5 met.

C✓ Both "A" and "C" RCPs are required to be secured.

Conditions of LCO 3.4.5 NOT met.

D. "A" RCP is required to be secured. "C" RCP is NOT required to be secured.

Conditions of LCO 3.4.5 NOT met.

The correct answer is C.

A. Incorrect. The first part of distractor is correct. Both AOP-018 and AOP-014 state that the RCP is to be tripped if any RCP motor bearing temperature is greater than 200°F. The conditions of LCO 3.4.5 are NOT met. LCO 3.4.5 requires that two RCS loops be operable and one RCS loop shall be in operation as long as the RTBs are open. Candidate may think that the loop is operable since the S/Gs are greater than 16%. However, LCO 3.4.5 bases states that an Operable RCS loop consists of one Operable RCP and one Operable S/G, which has a minimum water level specified in SR 3.4.5.2 ($\geq 16\%$). An RCP is Operable if it is capable of being powered and is able to provide forced flow if required. Since the B and C RCPs had to be secured due to high motor bearing temperatures then they are not available for operation.

B. Incorrect. Candidate incorrectly assumed that operation of "C" RCP is allowed at greater than 200°F Motor Bearing Temperature. The plausibility for this is that the limit for RCP Pump Bearing temperature is 225°F. See "A" above for remaining justification.

C. Correct.

D. Incorrect. Candidate incorrectly assumed that operation of "C" RCP is allowed at greater than 200°F Motor Bearing Temperature. The plausibility for this is that the limit for RCP Pump Bearing temperature is 225°F. It is plausible for the candidate to apply the conditions of LCO 3.4.4, RCS Loops - Modes 1 and 2, to this situation and think that 3.4.5 are NOT met. LCO 3.4.4 requires that all three loops be operable and in operation. Also, the candidate could have simply assumed that LCO 3.4.5 required all three loops to be Operable.

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Question 86

Tier/Group 2/1

K/A Importance Rating - RO 2.7 SRO 3.1

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 associated with RCP motors, including faulty motors and current, and winding and bearing temperature problems

Reference(s) - Sim/Plant design, APP-001, AOP-014, AOP-018, ITS 3.4.4, 3.4.5

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-014-004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 43.5 / 45.3 / 45.13

Comments -

SRO: Motor parameter being out of spec (above manual trip setpoint) requires RCPs to be secured, which renders RCS loops inoperable. Procedures, in the form of Tech Specs and AOPs, must be applied to mitigate the conditions. The question would qualify as SRO-only because the applicant must apply basis information to determine whether the loop is operable.

Reviewed and approved by MAB.

87. 007 A2.05 SRO 001

Given the following plant conditions:

- Plant is operating at 90% RTP following a refueling outage.
- PCV-455C, PZR PORV, has developed **excessive** seat leakage.
- APP-003-B3, PRT HI TEMP AND APP-003-C3, PRT HI PRESS, has alarmed.
- PRT Pressure is 6.1 psig and rising.
- RC-536, PZR PORV BLOCK, has been closed to isolate the leakage.

Which ONE (1) of the following completes the statements below?

IAW ITS LCO 3.4.11 Bases, PCV-455C (1) operable and power (2) required to be removed from RC-536.

A✓ (1) is NOT

(2) is NOT

B. (1) is

(2) is

C. (1) is

(2) is NOT

D. (1) is NOT

(2) is

The correct answer is A.

A. Correct.

B. Incorrect. ITS LCO 3.4.11 bases states that an Operable PORV is required to be capable of manually opening and closing, and not experiencing excessive seat leakage. This is a recent change to the ITS bases. In the past the bases did not address seat leakage. The PORV was only required to be capable of manually opening and closing to be considered operable. Candidate may think that since the PORV is leaking and must be isolated that it would be prudent to remove power to prevent inadvertent reinitiation of the PORV seat leakage.

C. Incorrect. ITS LCO 3.4.11 bases states that an Operable PORV is required to be capable of manually opening and closing, and not experiencing excessive seat leakage. This is a recent change to the ITS bases. In the past the bases did not address seat leakage. The PORV was only required to be capable of manually opening and closing to be considered operable. For this distractor the candidate incorrectly determines that the PORV is Operable. Therefore, it would seem logical that the PORV block valve would not have power removed.

D. Incorrect. The first part of the distractor is correct. The second part of the distractor would be correct if the PORV was inoperable and not capable of being manually cycled. In the situation given, the PORV is inoperable solely on the fact that it has excessive seat leakage.

Question 87

Tier/Group 2/1

K/A Importance Rating - RO 3.2 SRO 3.6

Ability to (a) predict the impacts of the following malfunctions or operations on the PRTS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Exceeding PRT high-pressure limits

Reference(s) - Sim/Plant design, AOP-019, AOP-016

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-016-002, AOP-019-002, PZR004

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 43.5 / 45.3 / 45.13

Comments - K/A match because candidate must determine the correct actions to take for a condition given that could lead to exceeding the pressure limits of the PRT.

SRO: The candidate must demonstrate knowledge of TS bases to determine the operability of a plant component.

Reviewed and approved by MAB.

88. 022 G2.4.50 SRO 001

Given the following plant conditions:

- The plant is operating at 100% RTP.
- HVH-1 is under clearance due to bearing damage.
- "B" CV Spray Pump has been declared inoperable due to a crack discovered in the casing.
- APP-002-A7, HVH-1/2/3/4 HI VIB, is received and the HIGH VIBRATION white light is illuminated for HVH-3.

Which ONE (1) of the following completes the statements below?

To attempt to reset the High Vibration Alarm, APP-002-A7 directs (1).

Due to local observations the SM has directed that HVH-3 be declared inoperable. The most time limiting ITS LCO required action is that (2).

(REFERENCE PROVIDED)

- A. (1) stopping HVH-3 prior to depressing the vibration switch reset pushbutton
 - (2) the containment spray train AND one containment cooling train be restored to OPERABLE status in 72 hours
- B✓ (1) resetting the high vibration alarm without stopping HVH-3
 - (2) entry into LCO 3.0.3 be performed immediately
- C. (1) stopping HVH-3 prior to depressing the vibration switch reset pushbutton
 - (2) entry into LCO 3.0.3 be performed immediately
- D. (1) resetting the high vibration alarm without stopping HVH-3
 - (2) the containment spray train AND one containment cooling train be restored to OPERABLE status in 72 hours

The correct answer is B.

A. Incorrect. The fan does not need to be stopped to reset the vibration alarm. Plausible since some components are required to be stopped to reset various functions. Entry into LCO 3.0.3 is required based on the given plant conditions with one train of CV Spray OOS and two trains of CV Cooling OOS.

B. Correct.

C. Incorrect. The fan does not need to be stopped to reset the vibration alarm. Plausible since some components are required to be stopped to reset various functions. The second half of the distractor is correct.

D. Incorrect. The first half of the distractor is correct. Entry into LCO 3.0.3 is required based on the given plant conditions with one train of CV Spray OOS and two trains of CV Cooling OOS.

Question 88

Tier/Group 2/1

K/A Importance Rating - RO 4.2 SRO 4.0

Containment Cooling System (CCS): Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Reference(s) - Sim/Plant design, APP-002-A7, ITS 3.6.6

Proposed References to be provided to applicants during examination - ITS 3.6.6

Learning Objective - CVHVAC 008

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.3

Comments -

SRO: Application of Required Actions of Tech Specs. Entry into ITS 3.0.3 will have the SRO direct controls of the plant to commence a plant shutdown to meet the timeliness of the ITS required actions.

MAB Comments:

The question tests what “should” be done. Why would it be wrong to stop HVH-3 when it has high vibes? Would it be possible for me to find an admin procedure that would allow an operator to secure a piece of equipment to protect it against further damage? The concern here is having one and only one correct answer. Why would C really be wrong? Suggestion: Reword the first part of the question: To reset the High Vibration Alarm, APP-002-A7 directs: stopping HVH-3 prior to resetting the vibration alarm vs. resetting the high vibration alarm without stopping HVH-3. **Revised as recommended.**

Does a motor calculation error make the “B” CV Pump inoperable? Does it depend on the specifics of the calculational error? How does your procedures define OOS? Can a piece of equipment simply be off and be considered OOS? **Stem revised to state that the spray pump is OOS due to a crack discovered in pump casing.**

Does the High Vibe alarm make HVH-3 inoperable? The question is set up to leave HVH-3 running, therefore, would it be wrong to assume operable until an operability recommendation could be produced by engineering? If it is clearly inoperable, then why would an operator try to restart them as stated in two of the distractors? **Question revised to remove this concern. The question focus is now on how to reset the High Vibration Alarm.**

89. 059 A2.03 SRO 001

Given the following plant conditions:

- The plant has experienced a Small Break LOCA inside Containment.
- PATH-1 is currently being implemented.
- The BOP became distracted and allowed AFW to feed the S/Gs to the following Narrow Range levels.
 - "A" S/G: 2%
 - "B" S/G: 10%
 - "C" S/G: 86%

Which ONE (1) of the following completes the statement below?

The major concern with "C" S/G is the increased dead weight (1) and isolation of feedwater to "C" S/G is required to be performed IAW (2).

- A. (1) and water hammer effects on main steamlines
 - (2) FRP-H.3, Response to Steam Generator High Level
- B. (1) and water hammer effects on main steamlines
 - (2) Supplement G, Steam Generator Isolation
- C. (1) on the S/G vessel external supports in the CV
 - (2) FRP-H.3, Response to Steam Generator High Level
- D. (1) on the S/G vessel external supports in the CV
 - (2) Supplement G, Steam Generator Isolation

The correct answer is A.

A. Correct.

B. Incorrect. The first part of the distractor is correct. The second half of the distractor would reduce S/G level, however, FRP-H.3 has the operator isolate steam prior to draining the S/G.

C. Incorrect. The S/G supports would experience a higher load, however, the S/G supports are designed to handle full S/Gs as experienced during cold shutdown conditions when S/Gs are placed in wet layup. The steam line supports may be challenged and the need for additional bracing is addressed in FRP-H.3. The second half of the distractor is correct.

D. Incorrect. The S/G supports would experience a higher load, however, the S/G supports are designed to handle full S/Gs as experienced during cold shutdown conditions when S/Gs are placed in wet layup. The steam line supports may be challenged and the need for additional bracing is addressed in FRP-H.3. The second half of the distractor would reduce S/G level, however, FRP-H.3 has the operator isolate steam prior to draining the S/G.

The S/G supports would experience a higher load, however, the S/G supports are designed to handle full S/Gs as experienced during cold shutdown conditions when S/Gs are placed in wet layup. The steam line supports may be challenged and the need for additional bracing is addressed in FRP-H.3.

Question 89

Tier/Group 1/1

K/A Importance Rating - RO 3.7 SRO 3.9

Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Overfeeding event

Reference(s) - Sim/Plant design, APP-006-F2, FRP-H.3, FRP-H.3BD, Supplement G.

Proposed References to be provided to applicants during examination - None

Learning Objective - FRP-H.3-003

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 43.5 / 45.3 / 45.13

Comments - Originally had "increased dead weight on the steam generator vessel supports." However, every validator chose this distractor due to it being so similar to the concern with the structural concerns associated with the steam lines.

SRO: Assessing plant conditions and then selecting a procedure to mitigate, recover, or with which to proceed. Procedure selection that is not a major EOP or Red/Orange FRP. The procedure required to be selected is a Yellow priority FRP. Also, testing the knowledge of the basis for the FRP.

MAB Comments:

Why is the second part of the distractors incorrect? I do not see any documentation that supports Supplement G being incorrect. Discuss with licensee to ensure that there is only one correct answer. **Revised the question to test knowledge of so that the first part of the answers will be shorter. C1 and D1 are incorrect since the concern is with increased dead weight on the main steamline supports and not the steam generator supports.**

H.3 is a yellow path. The question does not include a reference for the applicant. Is yellow path info required closed book knowledge at Robinson? **No, just knowlege of the purpose of the procedure.**

90. 064 G2.4.46 SRO 001

Given the following plant conditions.

- The plant was at 100% RTP and experienced a reactor trip coincident with a loss of the SUT.
- "A" and "B" EDG are supplying power to 480V buses E-1 and E-2.
- APP-010-E5, EDG RM A COOL FAN HI TEMP/OVLD, alarm is received.
- Readings from a calibrated temperature instrument indicate that EDG A room is at 128°F.

Which ONE (1) of the following completes the statements below?

"A" EDG (1) required to be declared inoperable. The actions required due to the alarm and temperature reading is to (2).

A. (1) is NOT

(2) notify the System Engineer to investigate the cause and initiate corrective action IAW APP-010-E5

B. (1) is NOT

(2) shutdown IAW OP-604, Diesel Generators "A" and "B"

C. (1) is

(2) notify the System Engineer to investigate the cause and initiate corrective action IAW APP-010-E5

D. (1) is

(2) shutdown IAW OP-604, Diesel Generators "A" and "B"

The correct answer is A.

A. Correct - Per APP-010-E5, the EDG A must not be declared inoperable unless the room exceeds 130°F. With the high temperature the system engineer must be notified and the cause of the alarm must be investigated and corrective actions initiated.

B. Incorrect. The first part of the distractor is correct. If the EDG was running for testing and the high temperature / alarm was due to a fan breaker tripping then the EDG would be shutdown IAW OP-604. Fan operation is not discussed in the stem of the question. This makes this distractor plausible.

C. Incorrect. The EDG room temperature must exceed 130°F prior to requiring that the EDG be declared OOS. The second part of the distractor is correct.

D. Incorrect - The EDG room temperature must exceed 130°F prior to requiring that the EDG be declared OOS. If the EDG was running for testing and the high temperature / alarm was due to a fan breaker tripping then the EDG would be shutdown IAW OP-604. Fan operation is not discussed in the stem of the question. This makes this distractor plausible.

Question 90

Tier/Group 2/1

K/A Importance Rating - RO 4.2 SRO 4.2

Emergency Diesel Generator: Ability to verify that the alarms are consistent with the plant conditions.

Reference(s) - Sim/Plant design, APP-010, OST-401-2, OP-604

Proposed References to be provided to applicants during examination - None

Learning Objective - EDG06

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 43.5 / 45.3 / 45.13

Comments - K/A match because candidate know the high temperature limit for EDG operability.

SRO: Candidate must assess plant conditions and then select a procedure to mitigate the conditions given. In this situation the SRO must know the content of APP-010-E5.

Revised 100% power to 100% RTP. Exam validation comment.

91. 011 G2.2.38 SRO 001

Given the following plant conditions:

- Plant is in Mode 3.
- PZR level transmitter LT-459 fails LOW.
- No operator actions are taken.
- At 1700 PZR level is 85.1% and rising at a rate of 0.5%/min.
- PZR pressure is being maintained constant.

Which ONE(1) of the following completes the statements below?

At the current rate of level rise (1) is the EARLIEST time at which the ITS 3.4.9, Pressurizer, will NOT be met.

The bases for the limit in this Mode is to ensure that the (2).

A. (1) 1712

(2) RCS does NOT go solid when criticality is achieved and preserves a steam space for pressure control

B✓ (1) 1714

(2) RCS does NOT go solid when criticality is achieved and preserves a steam space for pressure control

C. (1) 1712

(2) PZR level remains within the calibrated level range and provide protection against water relief through the PZR PORVs

D. (1) 1714

(2) PZR level remains within the calibrated level range and provide protection against water relief through the PZR PORVs

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The correct answer is B.

A. Incorrect. The time given is based on the Pressurizer Water Level - High reactor trip setpoint of 91%. The second half of the answer is correct.

B. Correct.

C. Incorrect. The time given is based on the Pressurizer Water Level - High reactor trip setpoint of 91%. The last half of the second distractor is from the basis for the Pressurizer Water Level-High reactor trip with the exception that it is to provide protection against water relief through the pressurizer safety valves. The PZR level indication is calibrated throughout the full range of indication.

D. Incorrect. The first half of the distractor is correct. The last half of the second distractor is from the basis for the Pressurizer Water Level-High reactor trip with the exception that it is to provide protection against water relief through the pressurizer safety valves. The PZR level indication is calibrated throughout the full range of indication.

Question 91

Tier/Group 2/2

K/A Importance Rating - RO 3.6 SRO 4.5

Pressurizer Level Control System (PZR LCS): Knowledge of conditions and limitations in the facility license.

Reference(s) - Sim/Plant design, System Description, ITS 3.4.9, ITS 3.4.9 Bases

Proposed References to be provided to applicants during examination - None

Learning Objective - PZR 010, 012

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.6 / 45.4

Comments - .

SRO: Knowledge of TS bases.

92. 045 A2.11 SRO 001

Given the following plant conditions:

- The plant was at 100% RTP.
- Power Distribution Control target values (100%).
 - N-41: -2.0% N-43: -2.0%
 - N-42: -2.0% N-44: -2.0%
- Target Band +/- 5%
- APL = 102%
- At 1600 the plant has just experienced two spurious OT Delta T turbine runbacks.
- At 1602 the plant stabilized at 88% RTP.

<u>Time</u>	<u>N-41 AFD</u>	<u>N-42 AFD</u>	<u>N-43 AFD</u>	<u>N-44 AFD</u>
1603	-10.1	-10.2	-10.1	-10.3
1617	- 8.9	-9.0	-8.9	-9.1
1642	- 7.1	-7.2	-7.1	-7.3
1705	- 6.9	-7.0	-6.9	-7.1
1710	- 6.5	-6.6	-6.5	-6.6

Which ONE (1) of the following completes the statement below?

IAW ITS 3.2.3, Axial Flux Difference, reactor thermal power (1) and the basis for this action is (2).

(REFERENCE PROVIDED)

- A. (1) is limited to a maximum of 90% RTP
 (2) the xenon axial distribution at this power level is not a significant accident analysis parameter
- B. (1) is limited to a maximum of 90% RTP
 (2) the radial xenon peaking factors assumed in the accident analysis cannot be exceeded at this power level
- C✓ (1) must be reduced to below 50% RTP
 (2) the xenon axial distribution at this power level is not a significant accident analysis parameter
- D. (1) must be reduced to below 50% RTP
 (2) the radial xenon peaking factors assumed in the accident analysis cannot be exceeded at this power level

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The correct answer is C.

A. Incorrect. The penalty points have exceeded 1 hour. Per ITS 3.2.3 power must be reduced to below 50%. Power could have stayed between 50% and 90% had less than 1 hour of penalty points been accumulated. The second half of the answer is correct.

B. Incorrect. The penalty points have exceeded 1 hour. Per ITS 3.2.3 power must be reduced to below 50%. Power could have stayed between 50% and 90% had less than 1 hour of penalty points been accumulated. The second half of the distractor is similar to the basis for being outside the acceptable operation limits. Distractor also refers to radial xenon peaking factor vice axial peaking factors.

C. Correct.

D. Incorrect. The first half of the distractor is correct. The second half of the distractor is similar to the basis for being outside the acceptable operation limits. Distractor also refers to radial xenon peaking factor vice axial peaking factors.

Question 92

Tier/Group 2/2

K/A Importance Rating - RO 2.4 SRO 2.9

Ability to (a) predict the impacts of the following malfunctions or operation on the MT/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Control problems in primary, e.g., axial flux imbalance; need to reduce load on secondary

Reference(s) - Sim/Plant design, ITS 3.2.3, FMP-009, ITS 3.2.3 Bases

Proposed References to be provided to applicants during examination - FMP-009

Target and Operating Band Diagram

Learning Objective - AOP-15-004, FMP-009-007

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 43.5 / 45.3 / 45.5

Comments -

SRO: Application of required actions in accordance with Tech. Specs. and bases of Tech. Specs.

93. 029 A2.01 SRO 001

Given the following plant conditions:

- The plant is at 100% RTP.
- Maintenance is preparing to enter the CV to repair a leak on a sensing line.
- CV Pressure Relief is in progress with CV pressure currently at 0.05 psig.
- CV Purge Gaseous Waste Release Permit has been issued to allow the CV Purge to commence.
- Both R-11 AND R-12 are in service.

Which ONE (1) of the following completes the statements below?

The CV Purge and CV Pressure Relief (1) be performed concurrently in accordance with Tech Specs.

R-14C, Auxiliary Building Vent Stack Noble Gas Monitor, (2) required to be operable during the CV Purge in accordance with the ODCM.

- A. (1) may
(2) is NOT
- B. (1) may
(2) is
- C✓ (1) may NOT
(2) is NOT
- D. (1) may NOT
(2) is

The correct answer is C.

A. Incorrect. A CV Purge and CV Pressure Relief may not be performed concurrently. This is 3.6.3 prohibits opening the 42 inch purge and 6 inch pressure relief valves simultaneously. R-14C is normally in service during a pressure relief and purge, but is not required as long as R-11 AND R-12 are both operable. This requirement is specified in the ODCM and EMP-022, Gaseous Waste Release Permits.

B. Incorrect. See discussion in "A" above.

C. Correct.

D. Incorrect. The first part of the distractor is correct. See discussion in "A" above.

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Question 93

Tier/Group 2 / 2

K/A Importance Rating - RO 2.6 SRO 2.8

Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Maintenance or other activity taking place inside containment

Reference(s) - Sim/Plant design, EMP-022, ODCM, OP-921

Proposed References to be provided to applicants during examination - None

Learning Objective - CVHVAC 007

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.5 / 43.5 / 45.3 / 45.13

Comments -

SRO: Knowledge Tech Spec requirements that are below the double line and greater than 1 hour. Application of Offsite Dose Calculation Manual (ODCM) requirements. Knowledge of requirements for gaseous release approvals, i.e., release permits.

RAB Comments:

Add "in accordance with Tech Specs" to the end of the first question statement.

Add "in accordance with ODCM" to the end of the first question statement.

Revised as recommended.

94. G2.1.31 SRO 001

Given the following plant conditions:

- The Motor Driven Fire Pump (MDFP) was started remotely per OST-603, MDFP and EDFP Test (Weekly).
- The MDFP supply breaker tripped open during OST-603.

Which ONE(1) of the following completes the statement below?

MDFP indication (1) available on the Containment Fire Protection Panel.

The Fire Suppression Water Supply System is considered (2) IAW FP-012, Fire Protection Systems Minimum Equipment and Compensatory Actions.

A. (1) is NOT

(2) Operable

B✓ (1) is

(2) Operable

C. (1) is NOT

(2) Inoperable

D. (1) is

(2) Inoperable

The correct answer is B.

A. Incorrect. The pump status lights on the CFPP in the control room will show dual indication. Second half of the distractor correct.

B. Correct.

C. Incorrect. The pump status lights on the CFPP in the control room will show dual indication. Per FP-012, only ONE fire pump is required for the Fire Suppression Water Supply System to be considered OPERABLE. This requirement is met by the Engine Driven Fire Pump being operable. An EIR will be filled out on the MDFP with a seven day return to service time or initiate an NCR.

D. Incorrect. First part of the distractor is correct. Per FP-012, only ONE fire pump is required for the Fire Suppression Water Supply System to be considered OPERABLE. This requirement is met by the Engine Driven Fire Pump being operable. An EIR will be filled out on the MDFP with a seven day return to service time or initiate an NCR.

Exert from FP-012.

8.2 Fire Suppression Water Supply System

NOTE: Each fire pump provides 100% of the required flow. Therefore, the loss of one (1) fire pump does not cause the Fire Suppression Water Supply System to be inoperable as described in 8.2.3.

8.2.1 The Fire Suppression Water Supply System shall be operable with:

- 1. Two (2) fire pumps, each with a capacity of 2,500 gpm, with their discharge aligned to the yard loop, **AND***
- 2. An operable flow path capable of taking suction from the Unit 2 intake structure **AND** transferring the water through distribution piping with operable sectionalizing **OR** isolation valves to the systems identified in Sections 8.3 and 8.4.*

8.2.2 With less than the above required equipment operable, restore the inoperable equipment to operable status within seven (7) days.

Question 94

Tier 3

K/A Importance Rating - RO 4.2 SRO 4.2

Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.

Reference(s) - Sim/Plant design, FP-012, System Description

Proposed References to be provided to applicants during examination - None

Learning Objective - FPW007

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10, 45.12

Comments - K/A match because candidate must know where the status of the MDFP can be obtained in the control room.

SRO: This question is SRO level because it is administration of fire protection program requirements for determining operability of the Fire Suppression Water Supply System.

Reviewed and approved by MAB.

95. G2.1.41 SRO 001

The plant is in a refueling outage with core reload in progress.

Which ONE(1) of the following completes the statements below with respect to the required Approval Authority for refueling activities?

The (1) is the required Approval Authority for bypassing refueling interlocks.

The (2) is the required Approval Authority for unlatching a fuel assembly in the core.

A. (1) Refueling SRO

(2) Refueling SRO

B.✓ (1) Shift Manager

(2) Refueling SRO

C. (1) Refueling SRO

(2) Reactivity Monitor (Reactor Engineer)

D. (1) Shift Manager

(2) Reactivity Monitor (Reactor Engineer)

The Correct Answer is B.

1. Incorrect - The Shift Manager is the approval authority for bypassing refueling interlocks. The second part of distractor is correct.

2. Correct

3. Incorrect - The Shift Manager is the approval authority for bypassing refueling interlocks. The refueling SRO will make the recommendation. The reactivity monitor will inform the refueling SRO that all indications are acceptable and recommends unlatching the fuel assembly. The refueling SRO is the approval authority.

4. Incorrect - The first part of distractor is correct. The reactivity monitor will inform the refueling SRO that all indications are acceptable and recommends unlatching the fuel assembly. The refueling SRO is the approval authority.

- d. The SM is the approval authority for bypassing Refueling Interlocks associated with refueling equipment. The SM must ensure the Refueling personnel are fully aware of the impact of bypassing any interlocks. (RAIL 94-0834)
- c. The Refueling SRO is responsible for the following:
- Monitoring and coordinating all evolutions involving fuel movement. This includes all refueling watchstations in the CV, SFP, and the Control Room
 - Supervising all evolutions and Refueling personnel involved in fuel and insert movement inside the CV
 - Ensuring proper conditions are established prior to authorizing gripper unlatching for fuel assemblies placed in the core
 - Verifying proper documentation of fuel handling operations in the CV
 - Remaining cognizant of current plant conditions relative to fuel handling operation such as Nuclear Instrumentation readings, RCS temperature and RCS boron concentration, CV relative humidity, RHR System status, Refueling Cavity level and boron concentration, SFP level, SFP temperature and boron concentration, SFP area relative humidity, and area radiation
 - Recommending to and obtaining the permission from the SM for the bypassing of any Refueling Interlocks. The Refueling SRO is responsible for ensuring that all Refueling personnel fully understand the impact of bypassing any interlocks (RAIL 94-0834)
 - The Refueling SRO must be active for licensed SRO watchstanding in accordance with OMM-001-5

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Question 95

Tier 3

K/A Importance Rating - RO 4.6 SRO 4.3

Knowledge of the refueling processes.

Reference(s) - AOP-020, Section B.,

Proposed References to be provided to applicants during examination - None

Learning Objective - AOP-020-04

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.2 / 41.1 / 43.6 / 45.13

Comments -

SRO: Fuel handling in the CV is an SRO only function. Refuel floor SRO responsibilities.

96. G2.2.35 SRO 001

Given the following plant conditions:

- A plant heatup from a refueling outage is currently in progress.
- Highest available RCS temperature is 325°F and rising.
- The "A" MDAFW Pump has been declared OOS.

Which ONE (1) of the following completes the statement below?

The current technical specification operational MODE is (1) and IAW the Tech Specs, a change to the next higher MODE based on conditions given is (2).

A. (1) 3

(2) allowed

B. (1) 4

(2) allowed

C. (1) 3

(2) NOT allowed

D✓ (1) 4

(2) NOT allowed

The correct answer is D.

A. Incorrect. LCO 3.0.4b (risk assessment evaluation) is not applicable for ITS 3.7.4, Auxiliary Feedwater (AFW) System. Mode is incorrect.

B. Incorrect. LCO 3.0.4b (risk assessment evaluation) is not applicable for ITS 3.7.4, Auxiliary Feedwater (AFW) System. Mode is correct.

C. Incorrect. Mode is incorrect. Mode 3 is not entered until temperature is greater than or equal to 350°F.

D. Correct. LCO 3.0.4b (risk assessment evaluation) is not applicable for ITS 3.7.4, Auxiliary Feedwater (AFW) System.

Exert from LCO 3.0.4

LCO 3.0.4 When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:

a. When the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time, or

b. After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate; exceptions to this Specification are stated in the individual Specifications, or

c. When an allowance is stated in the individual value, parameter, or other Specification.

This Specification shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

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Question 96

Tier 3

K/A Importance Rating - RO 3.6 SRO 4.5

Ability to determine Technical Specification Mode of Operation.

Reference(s) - Sim/Plant design, ITS Section 1.1, 3.0, 3.7.4

Proposed References to be provided to applicants during examination - None

Learning Objective - Intro to Tech Specs 001, 005; AFW 012

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 41.10 / 43.2 / 45.13

Comments -

SRO: Application of generic Limiting Condition of Operation requirements (LCO 3.0.1 thru 3.0.7)

MAB Comments:

Suggest changing A(2) and B(2) to "Allowed". I do not think conditionalizing the answer choices adds plausibility. **Revised as recommended.**

97. G2.2.42 SRO 001

Given the following plant conditions:

Initial Conditions at 1300 hours:

- The plant is at 100% RTP.
- "B" CCW Pump is under clearance for maintenance.
- Subsequently, "B" EDG is declared inoperable due to a broken fuel oil line.

Current Conditions at 1700 hours:

- Plant continues to operate at 100% RTP with the stated equipment inoperable.

Which ONE (1) of the following completes the statement below, based on the current plant conditions?

"C" CCW Pump is (1). The most limiting ITS LCO required action is / was (2).

A. (1) inoperable

(2) ITS LCO 3.0.3.

B. (1) inoperable

(2) restore either "B" OR "C" CCW Pump to operable status within 72 hours.

C. (1) operable

(2) the one hour off-site power verification.

D. (1) operable

(2) restore either "B" OR "C" CCW Pump to operable status within 72 hours.

The correct answer is A.

A. Correct - Candidate must apply the fact that with "B" EDG inoperable and the redundant CCW pump inoperable the respective feature supported by "B" EDG must be declared inoperable. Therefore, both CCW pumps that are powered from emergency buses are inoperable and ITS LCO 3.0.3 must be entered.

B. Incorrect - The first part of the distractor is correct. ITS 3.7.6 does not have an action statement for both trains OOS. The

C. Incorrect - The candidate may misapply the section in ITS 3.8.1 that requires you to declare required features supported by the inoperable DG inoperable when its required redundant feature is inoperable. The second half of the distractor would be correct if only "B" CCW pump was inoperable with "B" EDG inoperable. The one hour off-site power verification still has to occur even with the ITS 3.0.3 entry.

D. Incorrect. The candidate may misapply the section in ITS 3.8.1 that requires you to declare required features supported by the inoperable DG inoperable when its required redundant feature is inoperable. The second half of the distractor is correct with only one CCW powered from an emergency bus inoperable.

Question 97

Tier 3

K/A Importance Rating - RO 3.9 SRO 4.6

Ability to recognize system parameters that are entry-level conditions for Technical Specifications.

Reference(s) - Sim/Plant design, ITS 3.7.6, ITS 3.8.1, ITS 3.0.3

Proposed References to be provided to applicants during examination - None

Learning Objective - Intro to Tech Specs 005

Question Source - NEW

Question Cognitive Level - H

10 CFR Part 55 Content - 41.7 / 41.10 / 43.2 / 43.3 / 45.3

Comments -

SRO: Application of required actions in ITS beyond one hour time requirements.

MAB Comments:

A reference is required to be provided to the applicant if testing greater than one hour Tech Spec actions. I think the reference will cause the Mode 3 entry piece to not be plausible.

Also, the KA does not appear to be met at the SRO level. The Tech Spec entry is the part that meets the KA, but that is RO knowledge.

Suggestion: write a question where the PORV is on its backup nitrogen supply. I would expect the RO to know that the PORV will work, but it would be the SRO that would be required to know whether the PORV was operable. This is just one idea – there may be others.

Totally revised the question to have one CCW pump OOS with an EDG subsequently going OOS. Candidate is testing on knowledge of cascading LOC actions with an EDG OOS and application of ITS 3.0.3.

Based on exam validation comments, added Initial Conditions at 1300 hours and Current Conditions at 1700 hours to the stem of the question. Since four hours has elapsed the "C" CCW pump must be declared inoperable.

98. G2.3.4 SRO 001

Given the following plant conditions:

- A Site Area Emergency has been declared and all facilities are activated.
- The general radiation levels in Charging Pump Room is 130 Rem/hr.
- Entry into the area is required to perform a life saving activity.

Which ONE(1) of the following completes the statement below?

Based on **EPOSC-04, Emergency Work Control**, (1) is the **maximum** dose that the (2) can authorize the **assigned** worker.

- A. (1) 25 Rem
(2) Radiological Control Director
- B✓ (1) 25 Rem
(2) Site Emergency Coordinator
- C. (1) 10 Rem
(2) Radiological Control Director
- D. (1) 10 Rem
(2) Site Emergency Coordinator

The correct answer is B.

A. Incorrect - The first part of distractor is correct. The RCD can authorize up to 5 Rem and must approve several work activities during an event such as waiving requirements of the Emergency Work Permit. However, the SEC has the approval authority for emergency dose levels to save a life.

B. Correct -

C. Incorrect - 10 Rem is the maximum for protecting a piece of plant equipment. The RCD can authorize up to 5 Rem and must approve several work activities during an event.

D. Incorrect - 10 Rem is the maximum for protecting a piece of plant equipment. The second part of the distractor is correct.

Question 98

Tier 3

K/A Importance Rating - RO 3.2 SRO 3.7

Knowledge of radiation exposure limits under normal or emergency conditions.

Reference(s) - Sim/Plant design, EALs, DOS-NGGC-0004

Proposed References to be provided to applicants during examination - EAL Matrix

Learning Objective - EAL 004

Question Source - BANK

Question Cognitive Level - H

10 CFR Part 55 Content - 41.12 / 43.4 / 45.10

Comments -

SRO: Emergency Action Level Classification and determination of administrative dose limits.

MAB Comments:

The KA is not met at the SRO level. Radiation exposure limits are being tested at the basic rad worker (or RO) level. To hit the KA at the appropriate level, I would suggest testing emergency dose approval authorization for saving life or equipment. This is a common SRO question for this KA.

The E-Plan classification is not related to the KA.

Revised the question to test the candidate's knowledge of approval authority for emergency dose limits and the emergency limits for a life saving activity.

ILC-11-2 NRC Exam

99. G2.4.30 SRO 001

Given the following plant conditions:

A plant event has occurred that has resulted in 10 CFR50.54(x) being invoked for deviation from approved emergency procedures.

IAW AP-030, NRC Reporting Requirements, the NRC is required to be notified within _____ hour(s).

- A. ✓ 1
- B. 4
- C. 8
- D. 24

The correct answer is A.

A. Correct.

ATTACHMENT 11.1 Page 1 of 9 IMMEDIATE (ONE HOUR) NOTIFICATIONS TO THE NRC

IMMEDIATE (ONE HOUR) NOTIFICATIONS TO THE NRC			
10 CFR 50.72 states that immediate reports shall be made to the NRC Operations Center of these Emergency Events via the NRC Emergency Telecommunications System (ETS) as specified in the Emergency Plan. 10 CFR 50.72 additionally identifies Non-Emergency Events which are to be reported within one-hour, four-hours, or eight hours to the NRC. ETS Telephones, which are identified, are located in the Control Room, the TSC, and the EOP. In the event that the ETS is not available, 10 CFR 50.72(a)(2) permits the use of commercial telephone.			
EVENT	KEY WORDS	REQUIREMENT	EXAMPLES
NOTE: 10 CFR 50.72 recognizes the Emergency Plan and its four Emergency Classes of Unusual Event, Alert, Site Area Emergency and General Emergency.			
EMERGENCIES 10 CFR 50.72(a)(i) 10 CFR 50.32(i)(3)(viii) 10 CFR 40.31(i)(3)(viii) 10 CFR 72.75(a)	Emergency Unusual Event Alert Site Area Emergency General Emergency (SFS)	HBRSEP shall notify the NRC of the declaration of any of the Emergency Classes specified in the Emergency Plan. (See EPNOT-01)	<ul style="list-style-type: none"> Declaration of an Unusual Event, Alert, Site Area Emergency, or General Emergency. Discovery of an event that should have resulted in an Emergency Classification, but no emergency was declared. Discovery that a declared emergency exceeded the Emergency Action Levels for a higher emergency declaration, but the higher classification was not declared.
ERDS ACTIVATION 10 CFR 50.72(a)(4)	ERDS Emergency	HBRSEP shall activate the ERDS as soon as possible but not later than one hour after declaring an Alert, Site Area Emergency, or General Emergency.	<ul style="list-style-type: none"> An Alert, Site Area Emergency, or General Emergency is declared.
DEVIATION FROM TS (10 CFR 60.64(x)) 10 CFR 50.72(b)(1)	Deviation Departure License Condition	Any deviation from the TS authorized pursuant to 10 CFR 50.54(x).	<ul style="list-style-type: none"> Intentional deviation from an approved plant procedure in order to preserve plant safety 10 CFR 50.54(x).

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Question 99

Tier 3

K/A Importance Rating - RO 2.7 SRO 4.1

Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

Reference(s) - AP-030

Proposed References to be provided to applicants during examination - None

Learning Objective - AP-030-003

Question Source - New

Question Cognitive Level - H

10 CFR Part 55 Content - 41.10 / 43.5 / 45.11

Comments -

SRO: Off-site reporting requirements.

MAB Comments:

Does Robinson have a learning objective that supports asking this question in a closed book format? I am asking this to ensure that Robinson Training and Operations Management all agree that this is closed book knowledge at your facility. This question appearing in its current form in your Final Submittal will be viewed as the licensee officially agreeing that this is closed book knowledge for SROs at Robinson and therefore acceptable to appear in that manner on their NRC exam.

Operations Management has been consulted.

100. G2.4.43 SRO 001

Which ONE (1) of the following correctly completes the statements below regarding the process for which the NRC Headquarters Operations Officer (HOO) will contact the control room with a notification of a Nuclear Power Plant Attack Message?

An authentication code is contained in a book in the control room that (1) classified as safeguards information. If the incorrect code is given, IAW OMM-001-4, Communications, the SM or his designee is required to (2).

A. (1) is NOT

(2) receive the message and contact security to validate the threat

B. (1) is

(2) receive the message and contact security to validate the threat

C✓ (1) is NOT

(2) hang up and immediately call back the HOO

D. (1) is

(2) hang up and immediately call back the HOO

The correct answer is C.

A. Incorrect - The first part is correct. The second part are the actions if a threat was communicated to the control room via another source. These actions are IAW with Attachment 1 of AOP-034, Security Events. The question specifically states IAW OMM-001-4 with the call coming from the NRC.

B. Incorrect. This information is not safeguards information. Safeguards information must be kept under lock and key and available only to qualified personnel on a need-to-know basis. The second part are the actions if a threat was communicated to the control room via another source. These actions are IAW with Attachment 1 of AOP-034, Security Events. The question specifically states IAW OMM-001-4 with the call coming from the NRC.

C. Correct.

D. Incorrect - This information is not safeguards information. Safeguards information must be kept under lock and key and available only to qualified personnel on a need-to-know basis. The second part of the answer is correct.

ILC-11-2 NRC Exam

Question 100

Tier 3

K/A Importance Rating - RO 3.2 SRO 3.8

Knowledge of emergency communications systems and techniques.

Reference(s) - Sim/Plant design, OMM-001-4

Proposed References to be provided to applicants during examination - None

Learning Objective - OMM-001-4 Self Study

Question Source - NEW

Question Cognitive Level - F

10 CFR Part 55 Content - 41.10 / 45.13

Comments -

SRO: Recieving emergency communications from the NRC is an SRO only function at RNP.

MAB Comments:

This question tests what the HOO will do. Maybe the licensee should not test what the HOO might do? The HOO is not required to follow your OMM procedures. Would it not be possible that the HOO could ask if you were ready for the code, or wanted the code, prior to providing it? Maybe they would do that to ensure you were ready to receive the information. Would that be wrong?

Suggestion: Test where the code is stored or whether or not the code is safeguards information, or something of that nature. The second part of the answer choices are OK. Just the first part needs some work. There appears to be enough info in the OMM procedure to test something that will ensure only one correct answer to a further extent.

Revised the question to test whether or not the information is safeguards information and the actions is the incorrect code is given.