Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 1	1	1
K/A # APE.015.A2.08 RCP Malfunctions	Tier #	1	1
When to stop RCP on high temperature	Group #	1	1
	Importance Rating	3.4	3.5

Proposed Question:

The plant is operating normally at 100% power.

Which of the following conditions require a reactor trip followed by a trip of ONE RCP?

Answers

A.	Wrong	VCT temperature increases to 140° F.
B.	Wrong	The "A" train RPCCW containment header isolates.
C.	Wrong	Seal injection flow to the "A" RCP decreases to 5.0 GPM.
D.	Correct	The "A" RCP bearing oil temperature increases to 200° F.

Explanation (Optional):

High bearing temperature GREATER THAN 175° F requires a trip of the affected pump ('D' correct).

IF VCT temperature is greater than 135 degrees F AND RCS temperature is above 400 degrees F, then ALL RCPs must be stopped ('A' incorrect). (RCPs are also stopped at any time if VCT is above 150 degrees F).

Isolation of an RPCCW CTMT header directs opening the RPCCW CTMT cross tie valves. If this is unsuccessful, two RCPs will need to be tripped. ('B' incorrect).

Low seal flow requires pump trip if seal injection flow is less than 6 gpm AND thermal barrier cooling is also lost ('C' incorrect).

Technical Reference(s): AOP 3561 Foldout Page (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05431 Describe the operation of the RCPs under abnormal conditions... (As available)

Question Source: Significantly modified Bank # 0064306 Parent question attached on following page

Question History: Previous Test

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 2	2	2
K/A # W/E09.EK3.1 Natural Circulation	Tier #	1	1
Facility operating characteristics during	Group #	1	1
transients, and reasons for these characteristics.	Importance Rating	3.3	3.6

Proposed Question:

PLANT CONDITIONS:

- A hurricane warning is in effect for southeastern Connecticut.
- A reactor trip has occurred due to a loss of offsite power, and the crew has cooled down the plant using EOP 35 ES-0.2 NATURAL CIRCULATION COOLDOWN.
- The crew has been holding RCS cold leg wide range temperature stable for the past hour.
- Core Exit Thermocouples are reading 425°F
- Thot in all loops is 424°F
- Tcold in all loops is 392°F

If adequate natural circulation is occurring, what should be the approximate SG pressures, and what is the current Thot trend?

Answers

A.	Wrong	SG pressures reading 210 psig, with Thot slowly increasing due to decreasing natural circulation flow rates.
B.	Correct	SG pressures reading 210 psig, with Thot slowly decreasing due to lowering decay heat levels.
C.	Wrong	SG pressures reading 307 psig, with Thot slowly increasing due to decreasing natural circulation flow rates.
D.	Wrong	SG pressures reading 307 psig, with Thot slowly decreasing due to lowering decay heat levels.

Explanation (Optional): SG pressure should be at saturation pressure for Tcold ("C" and "D" wrong since this is saturation pressure for Thot). Thot should be slowly decreasing due to lowering decay heat levels ("A" and "C" wrong).

Technical Reference(s): ES-0.2 NATURAL CIRCULATION COOLDOWN
ES-0.1 REACTOR TRIP RESPONSE
WOG ERG Executive Volume, Generic Issues
Steam tables

(Attach if not previously provided)

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

Learning Objective:	MC-01873 identify the conditions which must be established... to ensure natural circulation in the RCS.	(As available)
Question Source:	New	
Question History:	None	
Question Cognitive Level:	Comprehension or Analysis	
10 CFR Part 55 Content:	55.41.5	
	55.41.10	

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 3	3	3
K/A # APE.024.GEN.2.4.4 Emergency Boration	Tier #	1	1
Ability to recognize entry level conditions for	Group #	1	1
Abnormal Operating Procedures	Importance Rating	4.0	4.3

Proposed Question:

Which of the following conditions would require the crew to initiate immediate boration of the RCS?

Answers

A.	Wrong	In MODE 5, with dilution paths NOT isolated and cold calibrated pressurizer level at 80%, core burnup is 9,000 MWD/MTU and RCS boron concentration is 2250 PPM (See attached curves).
B.	Correct	With the plant at 100% power, an unexplained event is causing Tave to increase to 590°F. Reactor power is increasing, and control rods are inserting.
C.	Wrong	After a reactor trip, with the crew performing ES-0.1 "Reactor Trip Response", the RCS cools down uncontrollably to 540°F.
D.	Wrong	While performing a rapid downpower IAW OP3575, the ROD CONTROL BANKS LIMIT Lo Alarm is received.

Explanation (Optional): "2" is correct, since this is an indication of an unexplained positive reactivity addition, "1" is wrong since there is adequate boron per the "loops filled" curve, and PZR level is >40%. "3" is wrong since the setpoint is 530F. "4" is wrong since Rod LO-LO is the Immediate Borate setpoint.

Technical Reference(s): AOP 3566 entry conditions (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Shutdown margin curves.

Learning Objective: MC-03960 Identify plant conditions that require entry into AOP-3566... (As available)

Question Source: Bank # 0064275
Question History: Previous Test and 97 NRC Exam
Question Cognitive Level: Comprehension or Analysis
10 CFR Part 55 Content: 55.41.10
55.43.2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 4	4	4
K/A # APE.026.AA1.02	Tier #	1	1
Loss of Component Cooling Water	Group #	1	1
Ability to operate / monitor loads from control room	Importance Rating	3.2	3.3

Proposed Question:

With the plant operating at 100% power, a loss of the "A" train of RPCCW occurs.

Which of the following groups of components will be affected?

Answers

A.	Correct	Letdown Heat Exchanger, SI Pump Cooling Surge Tank.
B.	Wrong	Letdown Heat Exchanger, Seal Water Heat Exchanger.
C.	Wrong	Excess Letdown Heat Exchanger, SI Pump Cooling Surge Tank.
D.	Wrong	Excess Letdown Heat Exchanger, Seal Water Heat Exchanger.

Explanation (Optional): Letdown heat exchanger, Train A (A correct)
SI Pump Cooling Surge Tank, A train (A correct)
Excess letdown heat exchanger, Train B (C and D wrong)
Seal Water heat exchanger, Train B (B and D wrong)

Technical Reference(s): P&ID 121A, B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05170 Given...CCP System ... determine the effects on RPCCW and on interrelated systems... (As available)

Question Source: Modified Bank # 0069069 (Parent attached)
Question History: Seen in program prior to modification
Question Cognitive Level: Memory or Fundamental Knowledge
10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
K/A # APE.027.AK2.03	Question record # 5	5	5
PZR Pressure Control System Malfunction	Tier #	1	1
Knowledge of interrelation with controllers and positioners	Group #	1	2
	Importance Rating	2.6	2.8

Proposed Question:

The following plant conditions exist:

- The Unit is operating at 100% power
- Pressurizer pressure control is in automatic
- One set of backup Heaters is energized in "ON"
- Actual pressurizer pressure is 2250 psia

The pressurizer Master Pressure Controller malfunctions and the **setpoint** is step changed from 2250 psia to 2000 psia.

Which of the following describes the initial automatic responses in the pressurizer Pressure Control System as a result of this failure?

Answers

A.	Wrong	PORV PCV-455A opens, Spray Valves open, and pressurizer control bank heaters go to minimum current.
B.	Wrong	PORV PCV-456 opens, Spray Valves open, and pressurizer control bank heaters go to minimum current.
C.	Correct	Spray valves open and pressurizer control bank heaters go to minimum current.
D.	Wrong	Spray valves close and control bank heaters go to maximum current.

Explanation (Optional): PORV s are not tied to the master pressure controller. (A and B incorrect)
Both the spray valves and heaters will be trying to maintain 2200 psia by opening spray valves and de-energizing heaters to lower pressure from 2250 psia to the new setpoint of 2200 psia. (D incorrect, C correct)

Technical Reference(s): Functional Drawing Sheets 11 & 12 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05341 Describe the operation of the pressurizer pressure and level control system under normal, abnormal, and emergency operating conditions. (As available)

Question Source: Modified Bank # 0068634

Question History: Previous test prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 6	6	6
K/A # W/E12.EK3.3 Uncontrolled Depressurization	Tier #	1	1
of all Steam Generators	Group #	1	1
Knowledge of reasons for manipulating controls.	Importance Rating	3.5	3.7

Proposed Question:

The crew is responding to four faulted Steam Generators using ECA-2.1 RESPONSE TO FOUR FAULTED STEAM GENERATORS. Narrow range level in all generators is off scale low, and auxiliary feedwater flow has been throttled to 100 gpm to each SG.

Why doesn't the crew completely isolate Aux Feed flow to the SGs?

A. Wrong Prevent the water in the feed ring from flashing to steam.

B. Wrong Minimize RCS cooldown.

C. Correct Prevent thermal shock to SG components.

D. Wrong Minimize the potential for a loss of secondary heat sink.

Explanation (Optional): Maintaining a minimum verifiable feed flow to the SGs allows the components to remain in a "wet" condition. If feed flow is isolated and the SGs are allowed to dry out, subsequent reinitiation of feed flow to the SGs could create significant thermal stress conditions on SG components.

Technical Reference(s): ECA-2.1 WOG Background Document (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03882 Discuss the basis of major procedure steps... in ECA-2.1 (As available)

Question Source: Bank # 0064968
Question History: Not seen in program
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5
55.41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 7	7	7
K/A # W/E08.EK1.3 Pressurized Thermal Shock	Tier #	1	1
Knowledge of operational implications of	Group #	1	1
conditions and remedial actions.	Importance Rating	3.5	4.0

Proposed Question:

EOP 35 FR-P.1 RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION provides actions necessary to limit the consequences of overpressure to the reactor vessel during which condition?

A. Correct Low temperatures following an RCS cooldown.

B. Wrong MODE 3 temperatures.

C. Wrong Normal operating temperature.

D. Wrong High temperatures following an RCS heatup.

Explanation (Optional): FR-P.1 entry conditions based on PTS (cooldown stress at high pressure) or cold overpressure (cold temperatures with overpressure).

Technical Reference(s): WOG Background Document (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04551 Identify the plant conditions that require entry into FR-P.1 (As available)

Question Source: Bank # 0065046
Question History: Not seen in program
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.8
55.41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 8	8	8
K/A # APE.051.AK3.01 Loss of Condenser Vacuum	Tier #	1	1
Knowledge of the reasons for loss of steam dump	Group #	1	1
capability upon loss of condenser vacuum.	Importance Rating	2.8*	3.1*

Proposed Question:
The following sequence of events occurs:

1. The plant was at 90% power with a thermal backwash in progress on the "A" condenser bay.
2. The only running circulating pump for the "A" condenser bay trips.
3. The crew trips the reactor due to high differential pressure between condenser bays.
4. "A" bay indicates 4 inches Hg absolute, "B" and "C" bays indicate 1 inch Hg absolute.
5. Significant decay heat causes RCS temperature to increase following the trip.

What is the temperature at which RCS Tave will stop increasing after the trip?

A.	Wrong	551°F
B.	Wrong	557°F
C.	Correct	561°F
D.	Wrong	567°F

Explanation (Optional): "C" is correct, since C-9 is blocked by either backpressure above 5 inches or loss of both circ pumps in the same bay. Tave will be maintained by the atmospheric dump valves at Tsat for SG pressure of 1140 psia. "A" is wrong, since this is lo-lo Tave steam dump block. "B" is wrong since steam dumps are blocked. "D" is wrong since this is Tsat for the SG safety valve setpoints, and the atmospheric dump valves will still work.

Technical Reference(s): Functional drawing # 10. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05630 Describe the operation of the following steam dump system controls and interlocks... C-9 control interlock. (As available)

Question Source: Catawba NRC exam

Question History: Not seen in program

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5
55.41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 9	9	9
K/A # EPE.055.EK1.02 Station Blackout	Tier #	1	1
Knowledge of operational implications of natural	Group #	1	1
circulation cooling	Importance Rating	4.1	4.4

Proposed Question:

With the plant at 100% power, a loss of all AC power occurred. When the reactor tripped, RCS pressure increased to 2350 psia. The crew is currently preparing to commence a cooldown of the RCS while in EOP 35 ECA-0.0 LOSS OF ALL AC POWER.

By what method was the overpressure event mitigated, and how will the crew cooldown the RCS?

A. Correct — Pressure was controlled automatically by the PZR PORVs, and the crew will cooldown the RCS using the Atmospheric Dump Bypass Valves locally.

B. Wrong — Pressure was controlled automatically by the PZR spray valves, and the crew will cooldown the RCS using the Atmospheric Dump Bypass Valves locally.

C. Wrong — Pressure was controlled automatically by the PZR PORVs, and the crew will cooldown the RCS using the Atmospheric Dump Valves.

D. Wrong — Pressure was controlled automatically by the PZR spray valves, and the crew will cooldown the RCS using the Atmospheric Dump Valves.

Explanation (Optional): PZR PORVs still function since they are powered by DC power, and spray valves will not work since driving head for PZR spray valves is lost with natural circulation flow. Aux spray is not used since loss of air has isolated the letdown line, losing preheating to the aux spray water. Cooldown is performed using Atmospheric Dump Bypass Valves locally due to loss of air to Atmospheric Dump Valves and loss of Control Power to Atmospheric Dump Bypass Valves.

Technical Reference(s): EOP 35 ECA-0.0 step 3.a.RNO and step 17 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04949 Describe the overall plant response to a Loss of All AC Electrical Power Event... (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.8, 41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 10	10	10
K/A # APE.057.AK3.01 Loss of Vital AC	Tier #	1	1
Instrument Bus	Group #	1	1
Knowledge for reasons for actions in EOP	Importance Rating	4.1	4.4

Proposed Question:

With the plant at 100% power, VIAC 1 is lost and the crew enters AOP 3564 LOSS OF ONE PROTECTIVE SYSTEM CHANNEL.

AOP 3564, step 3 directs the crew to verify normal letdown in service, and the RO reports that letdown has isolated.

What caused letdown to isolate?

A. Wrong Instrument Air has isolated to Containment.

B. Wrong Control Power has been lost to the Letdown Orifice Isolation Valves (3CHS*AV8149A, B, or C).

C. Wrong Control Power has been lost to the Letdown Containment Isolation Valves (3CHS*CV8152 or 3CHS*CV8160).

D. Correct A Pressurizer level channel has failed low.

Explanation (Optional): VIAC 1 feeds vital instruments. Response Not Obtained column has crew select operable PZR level channel and then restore letdown.

Technical Reference(s): AOP 3564 Step 3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-06752 ...stabilize plant conditions after the loss of VIAC-1. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5
55.41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 11	11	11
K/A # APE.062.AA1.07 Loss of Service Water	Tier #	1	1
Ability to operate / monitor flowrates to	Group #	1	1
components; interactions among the components	Importance Rating	2.9	3.0

Proposed Question:

The "A" train of service water has been lost and the crew has transitioned from AOP 3560 LOSS OF SERVICE WATER to AOP 3561 LOSS OF RPCCW.

Why will the crew be directed to isolate letdown if an "A" train service water pump can not be started?

A.	Wrong	Maintain RCS inventory control.
B.	Wrong	Prevent flashing in the seal water heat exchanger.
C.	Wrong	Minimize heatup in the "A" train RPCCW system.
D.	Correct	Prevent a challenge to RCP trip foldout page criteria.

Explanation (Optional): Letdown is cooled by "A" train RPCCW, which is cooled by "A" train service water. If letdown is not cooled, VCT temperature increases, and this hotter water is the supply for seal injection.

Technical Reference(s): AOP 3560 Loss Of Service Water (Attach if not previously provided)
AOP 3561 Loss of RPCCW Att. B, step 4 bases

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03928 Discuss basis of major procedure steps... (As available)

Question Source: Bank # 0070387
Question History: Not seen in program
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 12	12	12
K/A # APE.067.AK1.01 Plant Fire On Site	Tier #	1	1
Knowledge of operational implications of fire	Group #	1	1
classifications, by type.	Importance Rating	2.9	3.9

Proposed Question:

A deep seated electrical cable fire was burning out of control in the cable spreading area, and the crew chose to manually initiate a CO2 discharge into the area.

In EOP 3509.1 CONTROL ROOM, CABLE SPREADING AREA OR INSTRUMENT RACK ROOM FIRE, why is a different Control Room evacuation route required to be taken now that CO2 has discharged in the Cable Spreading Area?

A.	Correct	The Control Building west stairwell may now be uninhabitable.
B.	Wrong	The "A" Transfer Switch Panel must now be shifted to local operation first.
C.	Wrong	The Aux Shutdown Panel must now be activated prior to the Transfer Switch Panels.
D.	Wrong	The Cable Spreading Room doors must now be checked closed.

Explanation (Optional): A CO2 discharge into the cable spreading room could make the west stairwell uninhabitable.

Technical Reference(s): EOP 3509 Fire Emergency, Attachment C (Attach if not previously provided)
EOP 3509.1 Control Room, Cable Spreading Area or Instrument Rack Room Fire Note prior to step 1 and 12

Proposed references to be provided to applicants during examination:

Learning Objective: MC-06189 Discuss the basis of major EOP 3509.1 procedure steps... (As available)

Question Source: 0060643
Question History: Not seen in current program
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.8
55.41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 13	13	13
K/A # APE.068.GEN.2.4.27 Control Room	Tier #	1	1
Evacuation	Group #	1	1
Knowledge of fire in the plant procedures	Importance Rating	3.0	3.5

Proposed Question:

The following events occur:

1. A fire in the Instrument Rack Room causes a reactor trip.
2. The crew enters E-O, "Reactor Trip or Safety Injection."
3. The fire makes the Control Room uninhabitable, and EOP 3509, FIRE EMERGENCY directs the crew to implement EOP 3509.1 CONTROL ROOM, CABLE SPREADING AREA OR INSTRUMENT RACK ROOM FIRE.
4. A decision is made to evacuate the Control Room.

What should be done regarding E-0?

Answers

A.	Wrong	Evacuate the Control Room then return to the E-0, step in effect
B.	Wrong	Continue with E-0, substituting local actions for Control Room actions
C.	Correct	Exit E-0 and implement EOP 3509.1
D.	Wrong	Perform both procedures in parallel

Explanation (Optional): EOP 3509.1 Note prior to Step 1 and 12 states that E-0 should not be used. Shutdown method contained in EOP 3509.1 essentially replaces E-0.

Technical Reference(s): EOP 3509.1 Note prior to step 1 and 12. EOP 3509.1 basis (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-06188 Identify plant conditions requiring entry into EOP 3509.1 (As available)

Question Source: Bank # 0060633
Question History: Previous Test
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.10
55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
K/A # APE.069.GEN.2.4.35 Loss of Containment Integrity	Question record # 14	14	14
	Tier #	1	3
Knowledge of perameters and logic used to assess status of safety functions.	Group #	1	4
	Importance Rating	3.3	3.5

Proposed Question:

The plant has been operating at 100% power when a large break LOCA occurs.

T=0: The reactor trips and safety injection actuates.

T+6 minutes: The crew manually actuates CDA at E-0, step 12, since CTMT pressure is 37 psia and Quench Spray pumps are not running. Both Quench Spray pumps will not start.

T+15 minutes: The crew transitions to EOP 35 FR-Z.1 RESPONSE TO HIGH CTMT PRESSURE.

T+16 minutes: A PEO is dispatched to the ESF building to realign RSS pump "C", using EOP 35 FR-Z.1, Attachment "A".

EOP 35 FR-Z.1, Attachment "A" will align the "C" RSS pump to take a suction on the:

Answers

A.	Correct	RWST and discharge through the RSS CTMT spray ring.
B.	Wrong	CTMT sump and discharge through the RSS CTMT spray ring.
C.	Wrong	RWST and discharge through the QSS CTMT spray ring.
D.	Wrong	CTMT sump and discharge through the QSS CTMT spray ring.

Explanation (Optional): EOP 35 FR-Z.1 Attachment "A" aligns an RSS pump to take a suction on the RWST and discharge through its CTMT spray ring. This effectively converts one RSS pump into a QSS pump. CTMT sump level may be inadequate for taking a suction on the CTMT sump ("B" and "D" wrong), and the RSS pump will discharge through its own spray ring ("C" and "D" wrong).

Technical Reference(s): EOP 35 FR-Z.1 Attachment "A" (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04668 DISCUSS the basis of major procedure steps and/or sequence of steps in EOP 35 FR-Z.1. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 15	15	15
K/A # W/E06.EA2.2 Degraded Core Cooling	Tier #	1	1
Ability to determine and interpret adherence to	Group #	1	1
appropriate procedures	Importance Rating	3.5	4.1

Proposed Question:

Plant Conditions:

- The reactor has tripped.
- Core Exit Thermocouples are 744°F.
- The crew has transitioned to the appropriate recovery procedure.

While the crew is performing the depressurization of all intact steam generators to 140 psig, the INTEGRITY critical safety function status turns RED.

Which of the following statements describes the actions which should be taken by the crew in response to these conditions?

Answers

A.	Wrong	Complete the current step in the recovery procedure, then address FR-P.1.
B.	Wrong	Immediately transition to FR-P.1, and when completed return to the recovery procedure.
C.	Wrong	Perform appropriate actions of FR-P.1 concurrently with the action being performed.
D.	Correct	Complete the recovery procedure entirely then address FR-P.1.

Explanation (Optional): Caution prior to step 10 tells operator to remain in C.2, it is expected that during the depressurization, the integrity tree may turn RED, however to preclude core cooling problems that may be aggravated due to FR-P.1 actions later, C.2 should be completed, prior to addressing P.1 in this case.

Technical Reference(s): Core Cooling Status Tree (Attach if not previously provided)
EOP 35 FR-C.2, CAUTION prior to step 10. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04531 DISCUSS CONDITIONS WHICH REQUIRE TRANSITION TO OTHER PROCEDURES FROM EOP 35 FR-C.2. (As available)

Question Source:	Bank # 0065051
Question History:	Previous Test
Question Cognitive Level:	Comprehension or Analysis
10 CFR Part 55 Content:	55.43.5
Comments:	

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 16	16	16
K/A # APE.076.AA2.02 High RCS Activity	Tier #	1	1
Ability to determine and interpret corrective	Group #	1	1
actions required for high fission product activity.	Importance Rating	2.8	3.4

Proposed Question:

The plant was initially in HOT STANDBY with Tave at 557°F when RCS specific activity exceeded Technical Specification limits. To comply with Technical Specifications, the crew is currently cooling down the plant to less than 500°F.

What is the basis for maintaining the RCS temperature less than 500°F?

A.	Correct	Prevent the release of activity should a SG tube rupture, since RCS saturation pressure will be below the lift pressure of the atmospheric relief valves.
B.	Wrong	Minimize thermal stresses on the leaking fuel pins, limiting fission product release to the RCS.
C.	Wrong	Prevent the release of activity to containment should a loss of all AC power occur, by minimizing thermal stresses on the RCP seals.
D.	Wrong	Minimize offsite dose rates if a DBA LOCA occurs, by maintaining RCS temperature limit below the solubility limit for iodine.

Explanation (Optional): "A" is correct per tech spec basis. Saturation pressure for 500°F is 681 psia.

Technical Reference(s): Tech Spec 3.4.8 basis (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05444 Describe the major administrative or procedural precautions and limitations placed on the operation of the reactor coolant system, including the basis for each... (As available)

Question Source: MP3 95 NRC Exam with minor modifications

Question History: Not seen in current program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 17	17	17
K/A # APE.001.GEN.2.4.11 Continuous Rod Withdrawal	Tier #	1	1
	Group #	2	1
Knowledge of abnormal condition procedures	Importance Rating	3.4	3.6

Proposed Question:
The following initial plant conditions exist:

- The plant is at 70% power.
- All stator cooling perameters are normal.
- Tave matches Tref.
- Control bank "D" rods are at 205 steps.
- Rods start to step outward.

The RO places rod control in MANUAL, but this does not stop the rod motion.

Which one of the following actions should the crew take in response to this condition?

A. Wrong Increase turbine load to maintain Tave within 1.5°F of Tref utilizing the load limiter.

B. Wrong Initiate a boration as necessary to maintain Tave within 1.5°F of Tref.

C. Wrong Wait for C-11 to stop outward rod motion. If not, trip the reactor and go to E-0, REACTOR TRIP OF SAFETY INJECTION.

D. Correct Trip the reactor and go to E-0, REACTOR TRIP OF SAFETY INJECTION.

Explanation (Optional): AOP 3552 ROD CONTROL MALFUNCTION directs tripping the reactor if there is rod movement after taking rod control to MANUAL.

Technical Reference(s): AOP 3552 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03903 DISCUSS CONDITIONS WHICH REQUIRE TRANSITION TO OTHER PROCEDURES. (As available)

Question Source: Modified Bank # 0064996

Question History: Modified from MP3 95 NRC Exam Not seen in this program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.10
55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 18	18	18
K/A # APE.003.AK3.06 Dropped Control Rod	Tier #	1	1
Knowledge of the reason for resetting the demand	Group #	2	1
position counter to zero.	Importance Rating	2.7	3.0

Proposed Question:

While operating at 100% power, a control bank D group 1 rod drops. The crew has entered AOP 3552 MALFUNCTION OF THE ROD DRIVE SYSTEM and is ready to withdraw the dropped rod.

Shortly before the crew starts withdrawing the dropped rod, AOP 3552, Attachment "B" has the crew reset the control bank D group 1 step counter to zero.

Which of the following describes why the affected group step counter needed to be reset to zero?

A. Wrong This ensures that the P/A converter will send the proper rod height data to the RIL circuitry.

B. Correct This ensures that the rod is withdrawn to the proper height with a proper group step counter indication.

C. Wrong This prevents a ROD CONTROL URGENT FAILURE (MB4C 4-8) annunciator from coming in during the rod recovery.

D. Wrong This prevents a BANK D FULL ROD WITHDRAWAL (MB4C 5-8) annunciator from coming in during the rod recovery.

Explanation (Optional): "B" is correct since the crew will withdraw the affected rod to the previously recorded group height. "A" is wrong since the group step counter does not input to the P/A converter. It will need to be restored using AOP 3552 Attachment E. "C" is wrong since this alarm will come in regardless of group step counter position due to no group 2 rods moving during the rod recovery. "D" is wrong since bank D full rod withdrawal is fed by the P/A converter, not the group step counter.

Technical Reference(s): AOP 3552 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03902 DISCUSS THE BASIS OF MAJOR PRECAUTIONS, PROCEDURE STEPS/OR SEQUENCE OF STEPS. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5, 41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 19	19	19
K/A # EPE.007.K1.005 Reactor Trip	Tier #	1	1
Knowledge of operational implications of	Group #	2	2
decay power as a function of time.	Importance Rating	3.3	3.8

Proposed Question:

Initial conditions:

- The reactor has been operating at 100% power for several weeks.
- The TDAFW Pump is tagged out for maintenance.
- Assume that the "B" MDAFW pump can remove 1% decay heat.

A reactor trip occurs, and a PEO reports a mild rubbing sound coming from the "A" MDAFW pump.

About how much time after the trip can the crew stop the "A" MDAFW pump and still remove all of the decay heat with the "B" MDAFW Pump?

A. Wrong 4 to 8 seconds

B. Wrong 4 to 8 minutes

C. Correct 4 to 8 hours

D. Wrong 4 to 8 days

Explanation (Optional): The basic thumb rule for decay heat is as follows: 6% in 1 second ("A" wrong), 3% in one minute ("B" wrong), 1.5% in 1 hour ("C" correct), and 0.75% in one day ("D" wrong).

Technical Reference(s): INPO ACAD PHYSRV4.DOC (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MG-00929 Explain the relationship between decay heat generation and... time since reactor shutdown. (As available)

Question Source: Bank # GEN*FND 0062821

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.8, 41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 20	20	20
K/A # APE.008.AA1.06 PZR Vapor Space	Tier #	1	1
Accident	Group #	2	2
Ability to operate/monitor/control PZR level	Importance Rating	3.6	3.6

Proposed Question:

A small break LOCA occurs.

Which of the following Main Board trends can be used to diagnose the LOCA as a pressurizer vapor space loss of coolant accident?

Answers

A.	Wrong	Pressurizer level and pressure both increase.
B.	Wrong	Pressurizer level and pressure both decrease.
C.	Correct	Pressurizer level increases, pressure decreases.
D.	Wrong	Pressurizer level decreases, pressure increases.

Explanation (Optional): RCS pressure will quickly fall to approximately 1000 psia. Pressurizer level will initially decrease until the hot legs and upper core reach saturation. Two phase mixture flows up the surge line and into the pressurizer. This will cause pressurizer level to increase until the PZR is full of the two phase mixture.

Technical Reference(s): EOP background document, ES-1.2 (Attach if not previously provided)
Westinghouse MITCORE Text

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04914 Outline the unique characteristics of a PZR vapor space LOCA

Question Source: Bank # 0070037
Question History: Previous Test
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 21	21	21
K/A # EPE.009.EA1.15 Small Break LOCA	Tier #	1	1
Ability to operate and monitor PORV and	Group #	2	2
PORV block valves	Importance Rating	3.9	4.1

Proposed Question:

A small break LOCA has occurred and the crew has progressed to E-0, step 22 "Check PZR Valves". The RO reports that PORV 455A is open, and the US directs that the PORV be closed.

How did the RO verify <u>which</u> PORV was open, and how can flow through the PORV be isolated?

A. Wrong The PORV was verified open by tail piece temperature indication on Main Board 4 and flow is isolated by going to "CLOSE" on either the PORV control switch or associated block valve control switch on Main Board 4.

B. Correct The PORV was verified open by its red indicating light on Main Board 4 and flow is isolated by going to "CLOSE" on either the PORV control switch or associated block valve control switch on Main Board 4.

C. Wrong The PORV was verified open by its tail piece temperature indication Board 4 and flow can only be isolated by going to "CLOSE" on the associated PORV block valve control switch on Main Board 4.

D. Wrong The PORV was verified open by its red indicating light on Main Board 4 and flow can only be isolated by going to "CLOSE" on the associated PORV block valve control switch on Main Board 4.

Explanation (Optional): The red indicating light should be used to check PORV position. Tail pipe temperature only shows that a PORV <u>was</u> open, and does not differentiate between which of the two PORVs was or is open ("B" correct, "A" and "C" wrong). Both the PORV and its block valve can be operated from Main Board 4 ("B" correct, "C" and "D" wrong).

Technical Reference(s): E-0, step 22. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05339 Demonstrate the ability to manually manipulate:... PORV block valve and PORV (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 22	22	22
K/A # EPE.011.EK2.02 Large Break LOCA	Tier #	1	1
Knowledge of the interrelation between pumps	Group #	2	1
and a large break LOCA	Importance Rating	2.6*	2.7*

Proposed Question:

The following conditions exist:
- A LOCA has occurred
- Reactor Trip/Safety Injection occurred due to low pressurizer pressure
- The operating crew has completed the appropriate actions of E-0 and transitioned to E-1 LOSS OF REACTOR OR SECONDARY COOLANT.
- RCS pressure is stable at 600 psia
- RHR pumps have just been stopped per E-1, step 9.
- The following conditions exist inside containment:
    - Temperature, 170°F
    - Pressure, 22 psia
    - Radiation levels, 10 R/hr

Under which of the following conditions will the RHR pumps be required to be restarted?

Answers

A.	Correct	RCS pressure drops to less than 300 psia.
B.	Wrong	Pressurizer level drops to less than 16%.
C.	Wrong	Containment temperature increases to 180°F.
D.	Wrong	Containment radiation increases to 10^4 R/hr.

Explanation (Optional): "A" is correct since, to provide adequate ECCS flow, RCS pressure should be monitored to ensure that the RHR pumps are manually restarted if pressure decreases to LESS THAN 300 psia (500 psia ADVERSE CONTAINMENT). "B" is wrong, since ECCS reinitiation criteria (per the foldout page is pressurizer level less than 16%) does not apply until SI has been terminated. "C" is wrong, since RCS pressure is above the adverse CTMT setpoint of 500 psia. "D" is wrong, since RCS pressure is above the adverse CTMT setpoint and CTMT radiation would still be below Adverse CTMT value.

Technical Reference(s): EOP 35 E-1, step 9 and foldout page (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04361 DESCRIBE THE MAJOR ACTION CATEGORIES WITHIN EOP 35 E-1. (As available)

Question Source: Modified Bank # 0064244 (Note changes or attach parent)
Question History: Seen in program prior to modification
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 23	23	23
K/A # EPE.W/E04.EA2.2 LOCA Outside CTMT	Tier #	1	1
Ability to determine and interpret adherence to	Group #	2	1
appropriate procedures and	Importance Rating	3.6	4.2

Proposed Question:

The plant tripped from 100% power, and the following conditions exist:

- RCS pressure is 1780 psia and is slowly decreasing
- Abnormally high radiation alarms in the Aux Building
- All ECCS systems are operating per design
- Containment conditions are normal
- The crew has entered E-0 REACTOR TRIP OR SAFETY INJECTION.

Assuming plant conditions do not significantly change and the leak is unable to be isolated, what is the expected flow path through the EOP Network after exiting E-0?

Answers

A.	Wrong	E-1 "Loss of Reactor or Secondary Coolant", to ES-1.2 "Post LOCA Cooldown and Depressurization"
B.	Wrong	ECA-1.2 "LOCA Outside Containment", to E-1 "Loss of Reactor or Secondary Coolant"
C.	Correct	ECA-1.2 "LOCA Outside Containment", to ECA-1.1 "Loss of Emergency Coolant Recirculation"
D.	Wrong	E-1, "Loss of Reactor or Secondary Coolant", to ECA-1.2 "LOCA Outside Containment", to ECA-1.1 "Loss of Emergency Coolant Recirculation"

Explanation (Optional): "A" and "D" is incorrect because conditions for transitioning to E-1 from E-0, Step 26 will not be met with CTMT conditions normal. "D" is incorrect because the leak can not be isolated using the actions of ECA-1.2. Step 5 of ECA-1.2 will have the Crew transition to ECA-1.1.

"B" is incorrect since the crew will transition to ECA-1.2 from E-0, Step 32 due to high Aux. Bldg. radiation levels. (Note: ECCS termination criteria will not be met at Step 27 of E-0 due to decreasing RCS pressure). Based on the leak location the actions of ECA-1.2 will not be successful in isolating the leak. The crew should transition from ECA-1.2, Step 5 RNO to ECA-1.1. (C correct)

Technical Reference(s): E-0, Step 32
ECA-1.2, Entry Conditions and Step 5 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03875 Identify plant conditions that require entry into EOP 35 ECA-1.2. (As available)
MC-03878 Discuss conditions which require transition to other procedures from EOP 35 ECA-1.2.

Question Source: Bank # 0070263
Question History: Previous Test
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.5
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
K/A # EPE.W/E03.EK1.2 LOCA Cooldown and Depressurization	Question record # 24	24	24
Knowledge of operational implications of associated procedures.	Tier #	1	1
	Group #	2	2
	Importance Rating	3.6	4.1

Proposed Question:

PLANT CONDITIONS:

- The crew is performing the actions of ES-1.2, "Post-LOCA Cooldown and Depressurization."
- Both SIH pumps have been stopped
- The one running charging pump has been realigned to its normal charging path.
- The next major action category is to "Depressurize the RCS to minimize RCS subcooling".

What is the purpose of this action?

Answers

A.	Wrong	Minimize pressure stress to reduce PTS concerns.
B.	Correct	Minimize break flow and reduce RCS makeup requirements.
C.	Wrong	Reduce pressure to inject the accumulators.
D.	Wrong	Reduce pressure to allow RHR to inject into the RCS.

Explanation (Optional): RCS pressure is reduced to minimize break flow and reduce RCS makeup requirements. "A" is wrong since the cooldown rate is < 80°F per hour, and "C" and "D" are wrong since pressurizer level is maintained by the charging pump, and RHR pumps have been turned off and accumulator isolation valves will be closed.

Technical Reference(s): WOG Background Document for ES-1.2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05530 DISCUSS THE BASIS OF MAJOR PROCEDURE STEPS AND/OR SEQUENCE OF STEPS IN EOP 35 ES-1.2. (As available)

Question Source: Ginna 1998 NRC Initial License Exam

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.8, 41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
K/A # EPE.W/E11 EK1.3 Loss of Emergency	Question record # 25	25	25
Coolant Recirculation	Tier #	1	1
Knowledge of operational implications of	Group #	2	2
remedial actions.	Importance Rating	3.6	4.0

Proposed Question:
The following sequence of events has occurred:

1. The plant was initially at 100% power when an RCS LOCA occurred.
2. When attempting to swap over to cold leg recirculation, the crew was unable to provide a flowpath from the CTMT sump to the RCS.
3. The crew entered EOP 35 ECA-1.1 "Loss of Containment Recirculation"
4. SIS flow has been reduced to one train in order to delay RWST depletion.
5. Technical support reports that emergency coolant recirculation capability has been restored via the "C" RSS Pump.

What action should the crew take?

Answers

A.	Wrong	Establish minimum ECCS flow by starting and stopping RHR and/or SI pumps as necessary.
B.	Wrong	Establish normal charging and operate any of the ECCS pumps to maintain the required flow.
C.	Correct	Transition to EOP 35 ES-1.3 TRANSFER TO COLD LEG RECIRCULATION.
D.	Wrong	Transition to EOP 35 ECA-1.2 LOCA OUTSIDE CONTAINMENT.

Explanation (Optional): "A" is wrong since this action is taken only if the operators remain in ECA-1.1 and SI termination criteria is not met. "B" is wrong since normal charging is only established if SI termination criteria is met. "C" is correct and "D" is wrong since the crew should transition to the procedure and step in effect, which was ES-1.3.

Technical Reference(s): ECA-1.1,Note prior to step 1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03873 DISCUSS CONDITIONS WHICH REQUIRE TRANSITION TO OTHER PROCEDURES FROM EOP 35 ECA-1.1. (As available)

Question Source: New
Question History: None
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.8, 41.10 / 45.3
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 26	26	26
K/A # W/E.02.K1.03 SI Termination	Tier #	1	1
Knowledge of the operational implications of annunciators,	Group #	2	1
conditions indicating signals, and remedial actions	Importance Rating	3.5	3.8

Proposed Question:

The plant was at 100% power when a Safety Injection occurred.

The current plant conditions exist at the completion of E-0 step 14:

- SI has occurred.
- All SI equipment started.
- Containment Temperature is 110°F.
- RCS pressure is 2280 psia and increasing.
- CET's are 550°F and slowly decreasing.
- Pressurizer level is 50% and slowly increasing.
- SG levels are 10% narrow range and increasing.
- SG pressures are 1090 psig.
- All radiation monitors read normal.

Assuming conditions do not significantly change, in which procedure will the crew stop the SIH pumps?

A. Wrong E-1 - Loss of Primary or Secondary Coolant

B. Correct ES-1.1 - SI Termination.

C. Wrong ES-1.2 - Post LOCA Cooldown and Depressurization.

D. Wrong ES - 1.3 - Transfer to Cold Leg Recirculation.

Explanation (Optional): There are no conditions requiring transition to E-1, E-2, or E-3. SI Termination criteria is met. SIH pumps are not directed to be stopped in E-0.

Technical Reference(s): E-0 Reactor Trip or SI, steps 24 to 29 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04438 DISCUSS CONDITIONS WHICH REQUIRE TRANSITION TO OTHER PROCEDURES FROM EOP 35 E-0. (As available)

MC-05524 DESCRIBE THE MAJOR ACTION CATEGORIES WITHIN EOP 35 ES-1.1.

Question Source: Modified 1997 Millstone NRC Exam (Note changes or attach parent)

Question History: Not seen in program
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.45.3
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
K/A # APE.022.AA1.01 Loss of Reactor Coolant Makeup	Question record # 27	27	27
Ability to operate or monitor CVCS letdown and charging	Tier #	1	1
	Group #	2	2
	Importance Rating	3.4	3.3

Proposed Question:

The plant is at 100% power when the RO notices letdown flow oscillating due to flashing downstream of the letdown orifices.

What could have caused the flashing to occur?

A.	Wrong	The Regenerative Heat Exchanger has developed a tube leak.
B.	Wrong	3CHS*PCV131, Letdown Pressure Control Valve, has failed closed.
C.	Wrong	RPCCW flow to the Letdown Heat Exchanger has increased.
D.	Correct	3CHS*FCV121, Charging Line Flow Control Valve, has failed closed.

Explanation (Optional): Flashing will occur downstream of the orifices if either letdown is not adequately cooled, or if pressure drops excessively. "A" is wrong since a tube leak results in colder charging water leaking into the letdown line. "B" is wrong since this raises pressure downstream of the orifices. "C" is wrong since this cools the letdown stream. "D" is correct since this removes cooling from the letdown steam.

Technical Reference(s): P&ID 104A (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04201 Describe the major administrative or procedural precautions and limitations placed on... the CVCS System... (As available)

Question Source: Modified Bank # 0068582

Question History: Not seen in program

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 28	28	28
K/A # APE.032.AK2.01 Loss of Source Range NIS	Tier #	1	1
Knowledge of loss of Source Range NIS and power	Group #	2	2
supply, including switch positions	Importance Rating	2.7*	3.1

Proposed Question:

INITIAL CONDITIONS:

- The plant was at 100% power.
- NIS Power Range Channel N41 has failed high. All appropriate bistables have been tripped.
- A plant shutdown is commenced due to an approaching hurricane.

How will the shutdown be affected if an <u>additional</u> power range channel sticks at its 100% value during the shutdown?

A. Wrong Outward rod motion in automatic will not be blocked when power is reduced below 15% power.

B. Wrong The reactor will automatically trip when power is reduced below 10% power.

C. Wrong Both source range channels will have to be manually energized from MB4.

D. Correct Both source range channels can not be energized automatically or manually from MB4.

Explanation (Optional): "A" is wrong since C-5 (15% power auto rod block) is based on turbine impulse pressure. 2/4 power range channels > 10% prevent P-10 from resetting. Power above P-10 (10%) blocks the IR high flux trip and the PR high flux low setpoint trips ("B" is wrong), and blocks both source ranges from energizing ("C" is wrong and "D" is correct).

Technical Reference(s): Functional drawings 3, 4, and 16 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05229 FOR THE FOLLOWING CONDITIONS, DETERMINE THE EFFECTS ON THE NIS SYSTEM AND ON INTERRELATED SYSTEMS:... FAILURE OF TWO OR MORE POWER RANGE CHANNELS (As available)

Question Source: New

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7 / 45.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 29	29	
K/A # APE.037.AA1.08 SG Tube Leak	Tier #	1	
Ability to operate or monitor charging flow	Group #	2	
	Importance Rating	3.3	

Proposed Question:

The plant is at 100% power and the following conditions exist:

- All PZR heaters are energized
- Letdown flow is 75 gpm
- Charging Flow Controller 3CHS*FKV121 output has increased and charging flow indicates 88 gpm.
- SG levels are 50%
- Tave/Tref are matched

Which of the following events may be in progress?

Answers

A.	Wrong	The controlling PZR level channel has failed high.
B.	Wrong	An atmospheric dump valve has failed open.
C.	Wrong	A PZR spray valve has failed open.
D.	Correct	A SG Tube Leak has occurred.

Explanation (Optional): Charging flow has increased by about 30 gpm. "A" is wrong since PZR level channel failing high will cause charging to decrease. "B" is wrong since increased steam demand will cause Tave to decrease. "C" is wrong since increased spray flow will not significantly increase charging flow. "D" is correct since 30 gpm leakage is well within the capability of SGWLC to maintain SG level.

Technical Reference(s): Functional Drawing 11 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04919 DESCRIBE the major parameter changes associated with SGTRS (As available)

Question Source: New

Question History: Braidwood NRC Exam

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 30	30	30
K/A # APE.054.AA2.08 Loss of Main Feedwater	Tier #	1	1
Ability to determine and interpret the Steam flow	Group #	2	2
feed trend recorder	Importance Rating	2.9	3.3*

Proposed Question:

The plant is at 100% power with both TDMFPs in service, and the MDMFP in "pull-to-lock". Numerous annunciators alarm on MB5, and the BOP operator reports the following:

- The steam flow-feed flow recorders for all SGs indicate 0 mpph feed flow and 3.8 mpph steam flow.
- Both TDMFPs are still running.

Which of the following events may be in progress?

Answers

A.	Wrong	Main Feed header pressure instrument has failed low.
B.	Correct	Main Steam header pressure instrument has failed low.
C.	Wrong	The "A" SG narrow range level instrument has failed high.
D.	Wrong	Turbine impulse pressure instrument has failed high.

Explanation (Optional): The steam flow-feed trend recorder indicates a loss of main feed flow. "B" is correct since steam pressure failing low will cause feed pump master speed controller to slow down, reducing feed header pressure to less than SG pressure. "A" is wrong since this will cause feed pump speed to increase. "C" is wrong since this will only affect one SG. "D" is wrong since this will impact steam dump operation, not SGWLC.

Technical Reference(s): Functional Drawings 13 and 14 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05006 GIVEN A FAILURE, PARTIAL OR COMPLETE, OF THE MAIN STEAM SYSTEM, DETERMINE THE EFFECTS ON THE SYSTEM AND ON INTERRELATED SYSTEMS. (As available)

Question Source: New

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.5 / 45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 31	31	31
K/A # EPE.E05.EA1.3 Loss of Secondary Heat Sink	Tier #	1	1
Ability to operate and / or monitor for desired	Group #	2	2
operating results.	Importance Rating	3.8	4.2

Proposed Question:

A loss of secondary heat sink has occurred. Bleed and Feed has been initiated using one PORV.

Which of the following describes Bleed and Feed cooling effectiveness using only one PORV?

Answers

A.	Correct	Bleed and Feed cooling effectiveness decreases since less RCS depressurization allows less subcooled SI flow .
B.	Wrong	Bleed and Feed cooling effectiveness will not be affected since RCS depressurizes to saturation in either case.
C.	Wrong	Bleed and Feed cooling effectiveness will not be affected since RCS pressure rises to the PORV setpoint in either case.
D.	Wrong	Bleed and Feed cooling effectiveness increases since less RCS mass is lost through a single PORV.

Explanation (Optional): "A" is correct, since one open PZR PORV may not be sufficient to maintain adequate RCS bleed flow.

Technical Reference(s): WOG Background Document for FR-H.1, step 16. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04535 DISCUSS THE BASIS OF MAJOR PROCEDURE STEPS AND/OR SEQUENCE OF STEPS IN EOP 35 FR-H.1. (As available)

Question Source: Bank # 0070058
Question History: Previous Test
Question Cognitive Level: Memory or Fundamental Knowledge
10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 103		33
K/A # 009.GEN.2.4.12 Small Break LOCA	Tier #		1
Knowledge of crew roles and responsibilities during	Group #		2
EOP flowchart use	Importance Rating		3.9

Proposed Question:

A LOCA inside containment is in progress, and the RO reports containment perameters to the US as follows:

08:12 CTMT radiation levels are 8.1 x 10^3 R/HR, CTMT temperature is 152°F
08:15 CTMT radiation levels are 1.2 x 10^4 R/HR, CTMT temperature is 175°F
08:31 CTMT radiation levels are 9.3 x 10^4 R/HR, CTMT temperature is 181°F
08:38 CTMT radiation levels are 5.0 x 10^5 R/HR, CTMT temperature is 193°F

Which of the following is the first time ADVERSE CONTAINMENT (AC) parameters ~~would have to~~ MUST be used by the crew, and for how long will use of the AC numbers be required?

Answers

A.	Wrong	08:15, and AC numbers are in effect for the entire time the crew is in the EOP network.
B.	Wrong	08:15, and AC numbers are in effect until both CTMT temperature and radiation drop to below the adverse setpoints.
C.	Correct	08:31 and AC numbers are in effect for the entire time the crew is in the EOP network.
D.	Wrong	08:31, and AC numbers are in effect until both CTMT temperature and radiation drop to below the adverse setpoints.

Explanation (Optional): Adverse containment conditions are defined as either Ctmt temperature greater than 180°F, or Ctmt radiation greater than 10^5 R/hr. At 0831, CTMT temperature caused the crew to enter AC, and since radiation exceeded 10^5 R/hr, AC numbers will be used for the duration of the EOP network (C correct).

Technical Reference(s): OP 3272 EOP User's Guide (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04459 Discuss the indications of adverse containment conditions and explain why setpoints utilized within the emergency operating procedure network change when an adverse containment condition exists. (As available)

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 32	32	32
K/A # APE.060.AA1.02 Accidental Gaseous	Tier #	1	1
Radwaste Release	Group #	2	2
Ability to operate and / or monitor ventilation system	Importance Rating	2.9	3.1

Proposed Question:

With the plant at 100% power, an accidental gaseous release occurs from the turbine building stack. Shortly after the release, radiation monitors 3HVC*RE16A and 3HVC*RE16B go into alarm.

Assuming no operator action, how will the Control Room air pressurization system respond?

Answers

A.	Correct	The emergency pressurization air dump valves, 3HVC*SOV74A and 3HVC*SOV74B will open after a 60 second time delay.
B.	Wrong	Control building air intake ventilation valves, 3HVC*AOV25 and 3HVC*AOV26 will close after a 60 second time delay.
C.	Wrong	Control building emergency air recirc dampers, 3HVC*AOD119A and 3HVC*AOD119B immediately open.
D.	Wrong	No valves or dampers will reposition since no Control Building Isolation signal is present.

Explanation (Optional): CBI occurs when either HVC*16A-1 or HVC*16B-1 detect 1.5 x 10-5 uci/cc in the incoming air, or a containment pressure HI-1 signal is generated at 18 psia, or safety injection is manually initiated, (D incorrect), or CBI is manually actuated.
CBI signal immediately closes intake ventilation valves, kitchen area exhaust valves, purge exhaust valves, and makeup air dampers (B and C incorrect). Sixty seconds after initiation, the air flask isolation valves open, if the intake dampers are closed (A correct). CBI also realigns the tech support center for recirc. The emergency air recirc dampers must be manually realigned within 1 hour after the CBI (C incorrect).

Technical Reference(s): LSK 22-9G, 9E, 9H, 9M (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05215 Describe operation of HVC/HVK systems under the following... conditions:... High radiation detected by HVC*RE16A or B (As available)

Question Source: Modified Bank # 0069915 (Note changes or attach parent)

Question History: Seen in program prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record #	33	
K/A # APE.038.GEN.2.4.13 Steam Generator Tube Rupture	Tier #	1	
Knowledge of crew roles and responsibilities during	Group #	2	
EOP flowchart use	Importance Rating	3.3	3.9

Proposed Question:

A tube rupture has occurred on the "C" steam generator, and the crew is progressing through EOP 35 E-0 REACTOR TRIP OR SAFETY INJECTION.

Which of the following describes the BOP operator's responsibility concerning isolating AFW flow during this event?

A.	Wrong	The BOP must receive permission from the SM/US prior to isolating flow to any SG.
B.	Correct	The BOP must receive permission from the SM/US prior to isolating flow to the affected SG.
C.	Wrong	The BOP may isolate AFW flow to any SG without direction from the SM/US as long as he or she is not performing immediate actions.
D.	Wrong	The BOP may isolate AFW flow to any SG without direction from the SM/US as long as minimum heat sink requirements are met.

Explanation (Optional): The balance of plant operator may, at any time when not required to be performing an immediate action or sequenced steps, throttle AFW flow if minimum heat sink requirements are satisfied. This includes the following: Isolating AFW flow to a faulted SG Throttling flow to minimize RCS cooldown.

However, the SM/US should direct isolation of AFW flow to a ruptured SG when the minimum WR or NR ruptured SG level specified in E-3 is satisfied.

Technical Reference(s): OP 3272 EOP USERS GUIDE, Attachment 3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04454 STATE THE CONDITIONS WHICH WOULD ALLOW THE ACTION OF EITHER THE THROTTLING OR ISOLATION OF AUXILIARY FEED WATER FLOW TO A STEAM GENERATOR OR STEAM FLOW FROM A STEAM GENERATOR PRIOR TO BEING DIRECTED TO PERFORM THE ACTION BY A SPECIFIC STEP WITHIN THE EMERGENCY OPERATING PROCEDURE NETWORK. (As available)

Question Source: Modified bank # 0070169

Question History: Seen in program prior to modification.

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.10 / 45.12

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 34	34	
K/A # APE.028.AK2.03 PZR level Control Malfunction	Tier #	1	
Knowledge of interrelation between PZR level control	Group #	3	
Malfunction and controllers and positioners.	Importance Rating	2.6	2.9

Proposed Question:

The plant was at 100% power with all control systems in AUTO.
The crew commences a downpower using OP 3204 AT POWER OPERATIONS.
The pressurizer level controller 3CHS-LK459 level setpoint sticks at its original value.

If the PZR level controller is left in AUTO, which of the following describes Charging Flow Control Valve 3CHS*FCV121 response during the downpower?

Answers

A.	Wrong	3CHS*FCV121 will remain in the same position and letdown will isolate on low pressurizer level.
B.	Wrong	3CHS*FCV121 will open fully and the reactor will trip on high pressurizer level.
C.	Correct	3CHS*FCV121 will throttle open and maintain PZR level at 61.5%.
D.	Wrong	3CHS*FCV121 will remain at the same position and maintain PZR level at 61.5%.

Explanation (Optional): With the setpoint remaining at 61.5% PZR level, the charging flow control valve will throttle open as power is reduced since as Thot decreases, the water becomes more dense and PZR level will tend to decrease.

Technical Reference(s): Functional sheet 11 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05342 GIVEN A FAILURE, PARTIAL OR COMPLETE, OF THE PRESSURIZER PRESSURE AND LEVEL CONTROL SYSTEM, DETERMINE THE EFFECTS ON THE SYSTEM AND ON INTERRELATED SYSTEMS. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.8, 41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 35	35	35
K/A # APE.056.AK1.04 Loss of Offsite Power	Tier #	1	1
Knowledge of definition of saturation conditions,	Group #	3	3
and its operational implications	Importance Rating	3.1*	3.2*

Proposed Question:

Offsite power has been lost and the crew is preparing to perform a cooldown using ES-0.2 NATURAL CIRCULATION COOLDOWN. Only one CRDM fan is available.

How does having only 1 CRDM fan impact the natural circulation cooldown?

Answers

A.	Wrong	The crew should go to ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (with RVLMS).
B.	Wrong	The crew should wait at step 1 of ES-0.2, NATURAL CIRCULATION COOLDOWN until an RCP can be started.
C.	Wrong	The crew should maintain the natural circulation cooldown rate LESS THAN 80° F/hr, and subcooling should be maintained greater than 132°F.
D.	Correct	The crew should align a reactor vessel head vent letdown path and then conduct the cooldown in the same manner as if two CRDM fans are running.

Explanation (Optional): D is correct based on ES-0.2 step 6 and 13 RNO. The added head cooling path prevents drawing a void in the head.
A is wrong, ES-0.3 is used when an increased cooldown rate is required (Note prior to ES-0.2, step 13).
B is wrong, the logic in ES-0.2 step 1 does not prevent continuing if < CRDM fans are available.
C is wrong, a 50°F/hr cooldown rate requirement exists whether or not 2 CRDM fans are available, and 132°F subcooling is only a requirement if the head vent path can not be aligned.

Technical Reference(s): ES-0.2 Natural Circ Cooldown steps 6, 11, and 13 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05944 Discuss the basis of major procedure steps and/or sequence of steps in EOP 35 ES-0.2, Natural Circulation Cooldown. (As available)

Question Source: Modified Bank # 0067597

Question History: Seen on previous test prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.8, 41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record #	36	
K/A # APE.065.AK3.03 Loss of Instrument Air	Tier #	1	
Knowing effects on plant operation of isolating	Group #	3	
certain equipment from instrument air	Importance Rating	2.9	3.4

Proposed Question:

The operators have manually tripped the plant due to a complete loss of instrument air, and are currently stabilizing the plant using EOP 35 ES-0.1 REACTOR TRIP RESPONSE.

What equipment is available to the operators for control of major plant perameters?

A.	Wrong	A letdown path is available through the loop drain valves, RCS temperature control via the atmospheric dump valves, and PZR pressure control via heaters and PORVs.
B.	Wrong	A letdown path is available through the loop drain valves, RCS temperature control via the atmospheric dump bypass valves, and PZR pressure control via heaters and auxiliary spray valves.
C.	Wrong	A letdown path is available through the head vent path, RCS temperature control via the atmospheric dump valves, and PZR pressure control via heaters and auxiliary spray valves.
D.	Correct	A letdown path is available through the head vent path, RCS temperature control via the atmospheric dump bypass valves, and PZR pressure control via heaters and PORVs.

Explanation (Optional): On loss of instrument air, letdown isolates and the loop drain valves fail closed. The condenser steam dump and atmospheric steam dump valves fail closed. The normal and auxiliary PZR spray valves fail closed.

Technical Reference(s): AOP 3562 LOSS OF INSTRUMENT AIR (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05324 GIVEN A FAILURE, PARTIAL OR COMPLETE, OF PLANT AIR SYSTEMS, DETERMINE EFFECTS ON THE SYSTEMS AND INTERRELATED SYSTEMS. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5, 41.10

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
K/A # 001.K1.03 Control Rod Drive System	Question record # 37	37	
Knowledge of physical connections and / or cause-effect relationship between CRDMs and Rod Control System.	Tier #	2	
	Group #	1	
	Importance Rating	3.4	3.6

Proposed Question:

INITIAL CONDITIONS:

- Plant is at 50% power.
- A load increase is in progress per OP3204 AT POWER OPERATIONS.
- A lift coil fuse blows for a Control Bank "D", Group 1 rod.

Which of the following describes the response of the rod control system to the next "outward" control rod demand signal?

A.	Wrong	The affected rod will drop while the rest of Control Bank "D" will move out.
B.	Wrong	The affected rod will move in while the rest of Control Bank "D" will move out.
C.	Correct	The affected rod will not move while the rest of Control Bank "D" will move out.
D.	Wrong	All of Control Bank "D" will not move and an "urgent failure" alarm will come in.

Explanation (Optional): The stationary gripper will energize to full current, the movable will energize to grip the rod, the stationary gripper will deenergize, releasing the rod, and the lift coil will fail to energize, resulting in no rod movement ("C" correct). The stationary gripper will then energize to grip the rod, and the moveable gripper will deenergize to release the rod.

Technical Reference(s): AOP 3552 Rod Control System Malfunction (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-000015 Given one of the below listed failures (partial or complete) of the Rod Control System, determine the effects on the system and on interrelated systems: ... Stuck Rod... (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.2 to 41.9

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 38	38	38
K/A # 001.K6.14 Control Rod Drive System	Tier #	2	2
Knowledge of the effect of a loss or malfunction on the	Group #	1	1
location and interpretation of the reactor trip breakers	Importance Rating	4.0	4.1

Proposed Question:

INITIAL CONDITIONS:

- The plant is at 100% power.
- I&C is performing testing on the reactor protection system.
- The "B" Reactor Trip Bypass Breaker is closed.

The following sequence of events occurs:

- I&C testing results in an inadvertent train "B" SIS.
- The crew enters E-0 REACTOR TRIP OR SAFETY INJECTION.
- The "B" Reactor Trip and Bypass breakers fail to open.
- A PEO is dispatched to locally open the breakers.
- The PEO fails to open the "B" Reactor Trip Bypass breaker.
- Per E-0 step 7, the crew manually actuates the "A" train of SIS.

What operational implication, if any, is there in having the "B" Reactor Trip Bypass breaker remain closed?

A.	Wrong	There are no operational implications.
B.	Wrong	All valves associated with FWI will have to be manually closed.
C.	Correct	The steam dumps are still controlled by the load reject controller.
D.	Wrong	Neither train of SI can be reset.

Explanation (Optional): The P-4 signal requires both the reactor trip breaker and bypass breaker to be open ("A" wrong). P-4 train "B" trips the turbine, closes the Feed Water Isolation Valves, aligns the steam dumps to the plant trip controller ("C" correct), and blocks Train "B" auto SIS after SI is reset. Also, "A" train of SIS can be reset even if I&C "B" Train SIS actuating signal is still present ("D" wrong). "B" is wrong since P-4 Train "A" closes the FRVs on low Tave, and SIS provides a FWI signal.

Technical Reference(s): Functional Sheets 2, 10, and 14 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05493 Describe the operation of the following RPS controls and interlocks: ... P-4... (As available)

Question Source: New
Question History: None
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 39	39	
K/A # 001.A4.11 Control Rod Drive System	Tier #	2	
Ability to determine shutdown margin.	Group #	1	
	Importance Rating	3.5	4.1

Proposed Question:

The plant is in MODE 3 with a reactor shutdown in progress. The Reactor Operator begins inserting shutdown Bank "E".

Which of the following describes the effect this action will have on both SHUTDOWN MARGIN (SDM) and the amount the reactor is Shutdown?

Answers

A.	Wrong	SDM and the Amount the Reactor is Shutdown will remain the same.
B.	Correct	SDM will remain the same and the Amount the Reactor is Shutdown will increase.
C.	Wrong	SDM will decrease and the Amount the Reactor is Shutdown will remain the same.
D.	Wrong	SDM and the Amount the Reactor is Shutdown will increase.

Explanation (Optional): SDM will not change based upon rod position, since the definition of SDM considers all rods to be fully inserted. SDA will increase because negative reactivity is being added by rod insertion.

Technical Reference(s): Generic Fundamentals Reactor Theory Text, chapters 5 & 8
OP 3209B SHUTDOWN MARGIN CALCULATION
Tech Spec Definitions
(Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-00134 Upon completion of this lesson, the operator will be able to determine how changes in the variable reactivity parameters will affect shutdown margin. (As available)

Question Source: Modified Bank # 0069897
Question History: Seen in program prior to modification
Question Cognitive Level: Comprehension or Analysis
10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 40	40	40
K/A # 003.K1.10 Reactor Coolant Pump	Tier #	2	2
Knowledge of physical connections and / or cause-effect relationship between RCPs and RCS	Group #	1	1
	Importance Rating	3.0	3.2

Proposed Question:

Which of the following RCP components helps to mitigate the consequences of a partial loss of reactor coolant flow?

Answers

A.	Wrong	Anti-rotation device.
B.	Wrong	Lower radial bearing.
C.	Wrong	Thrust bearing.
D.	Correct	Flywheel.

Explanation (Optional): The RCPs are designed with a flywheel to provide coast-down flow following loss of power.

Technical Reference(s): FSAR chapters 5.4.1.3.2 & 15.3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05431 DESCRIBE THE OPERATION OF THE RCP SYSTEM UNDER ABNORMAL CONDITIONS: A. RCP AUTOMATIC TRIPS B. CONDITIONS REQUIRING AN RCP TRIP C. RCP ASSOCIATED REACTOR TRIPS (As available)

Question Source: Bank # 0070065
Question History: Previous Quiz / Test
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.2 to 41.9

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 41	41	
K/A # 003.K3.02 Reactor Coolant Pump	Tier #	2	
Knowledge of the effect of a loss of malfunction	Group #	1	
of an RCP will have on the SGs	Importance Rating	3.5	3.8

Proposed Question:

With the plant operating at 30% power, the "D" RCP trips.

Which of the following describes the status of steam flow from the "A", "B", and "C" SGs one minute after the pump trip?

Answers

A.	Wrong	Decreased due to "D" SG temperature increasing to approximately RCS T-hot.
B.	Correct	Increased due to "D" SG temperature decreasing to approximately RCS T-cold.
C.	Wrong	Decreased due to decreased steam pressure in the "A", "B", and "C" SGs.
D.	Wrong	Increased due to increased steam pressure in the "A", "B", and "C" SGs.

Explanation (Optional): When the pump stops, the running pumps will reverse flow through the idle loop. The idle loop temperature will become very close to Tcold of the steaming loops. The affected steam generator will stop steaming due its pressure dropping, resulting in increased steam flow from the other 3 SGs.

Technical Reference(s): Transient analysis text. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03349 FOR GIVEN PLANT CONDITIONS, QUALITATIVELY STATE THE EFFECT OF ... RCP TRIP (on)... LOOP AVERAGE TEMPERATURES (AFFECTED AND NON-AFFECTED LOOPS),... STEAM PRESSURE (AFFECTED AND NON-AFFECTED LOOPS)... (As available)

Question Source: Bank # 0070045

Question History: Previous Quiz / Test

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 42	42	42
K/A # 004.K2.03 Chemical and Volume Control	Tier #	2	2
Knowledge of bus power supplies to the charging pumps	Group #	1	1
	Importance Rating	3.3	3.5

Proposed Question:

With the plant at 100% power, an LOP occurs, and the "B" EDG failed to start. The crew is currently performing EOP 35 ES-0.1 REACTOR TRIP RESPONSE.

Which of the following pumps is running?

Answers

A.	Wrong	"A" Reactor Coolant Pump
B.	Correct	"A" Charging Pump
C.	Wrong	"A" SIH Pump
D.	Wrong	"A" Circulating Water Pump

Explanation (Optional): Only the "A" CHS and SIH pumps still have power. 34A supplies the circ pump, and 35A supplies the RCP. The SIH pump did not start since SIS has not actuated.

Technical Reference(s): OPS Form 3308-6 Electrical Checklist for High Pressure Safety Injection (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05024 Given the following failure of the 4 kV Distribution system or a portion of the system, determine the effects on the system and on interrelated systems: 4 kV bus deenergization on safety-related and non-safety loads (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 43	43	
K/A # 004.K4.01 Chemical and Volume Control System	Tier #	2	
Knowledge of CVCS design feature which provides for	Group #	1	
oxygen control in the RCS	Importance Rating	2.8	3.3

Proposed Question:

An operator commences a fairly large dilution while raising power from 50% to 80%.

What adverse condition could occur if "Alternate Dilute " is used for the entire dilution?

Answers

A.	Correct	RCS Oxygen concentration could increase.
B.	Wrong	RCS Hydrogen concentration could increase.
C.	Wrong	RCS Tritium concentration could increase.
D.	Wrong	A reactivity excursion could occur, especially late of life.

Explanation (Optional): 4.6 CAUTION: ALTERNATE DILUTE must be used only for small concentration reductions or for short periods of time at the beginning of large dilutions since it allows the RCS H2 concentration to become depleted more rapidly than in the DILUTE mode.

Technical Reference(s): OP 3304C CAUTION prior to step 4.6.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04201 Describe the major administrative or procedural precautions and limitations placed on the operation of the following systems: A. Chemical and Volume Control System B. Charging Pump Cooling System C. Primary Makeup System (As available)

Question Source: Modified Bank # 0068349 (Note changes or attach parent)

Question History: Seen on previous test prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 44	44	
K/A # 004.K6.17 Chemical and Volume Control System	Tier #	2	
Knowledge of the effect of a loss of the emergency	Group #	1	
boration flowpaths.	Importance Rating	4.4	4.6

Proposed Question:

The crew has entered AOP 3566 IMMEDIATE BORATION, and can not get emergency boration valve 3CHS*MV8104 to open.

Which of the flowpaths listed below are acceptable boration flowpaths?

Answers

A.	Wrong	35 gpm from the RWST, or 35 gpm from the gravity boration path.
B.	Wrong	35 gpm from the RWST, or 110 gpm from the gravity boration path.
C.	Correct	110 gpm from the RWST, or 35 gpm from the gravity boration path.
D.	Wrong	110 gpm from the RWST, or 110 gpm from the gravity boration path.

Explanation (Optional): While on the gravity boration path, net charging flow to the RCS must be limited to LESS THAN 75 gpm (charging + seal injection - RCP seal return) ("B" and "D" wrong). While on the RWST, at least 100 gpm is needed to be equivalent to 33 gpm from the BAT Tanks ("A" and "B" wrong).

Technical Reference(s): AOP 3566 IMEDIATE BORATION step 1.b and e. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03961 Describe the major action categories contained within AOP-3566, Immediate Boration. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 45	45	
K/A # 013.K3.02 ESF Actuation System	Tier #	2	
Knowledge of the effect of a loss or malfunction	Group #	1	
of ESFAS will have on the RCS.	Importance Rating	4.3	4.5

Proposed Question:

With the plant at 100% power, a loss of all feedwater occurs.

- The SGs reach the LO-LO level reactor trip setpoint, but the reactor fails to trip.
- The crew is NOT successful at tripping the reactor manually.
- The crew enters FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION - ATWS.

Why is it imperative that the main turbine is tripped shortly after the onset of this event?

Answers

A.	Wrong	Prevents missile generation from turbine overspeed when the main generator output breakers open.
B.	Wrong	Shuts down the reactor by allowing the RCS to heat up.
C.	Correct	Conserves steam generator inventory, preventing the RCS from exceeding its emergency pressure limit.
D.	Wrong	Rapidly transfers heat load to the condenser steam dumps.

Explanation (Optional): During a loss of feed ATWS, tripping the turbine extends the time to SG tube uncovery, limiting the RCS temperature rise, and the resulting RCS pressure spike. IF the turbine is not tripped (by either the operator or AMSAC), RCS pressure could exceed the 3200 psia emergency pressure limit.

Technical Reference(s): WOG Bkgd document for FR-S.1 (Attach if not previously provided)
WOG Subcriticality MITCORE Text

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04945 Assuming no Operator-initiated recovery technique, ANALYZE the ATWS Event leading to Core Damage. (As available)

Question Source: Modified Bank # 0069971 (Note changes or attach parent)
Question History: Seen on previous test prior to modification
Question Cognitive Level: Memory or Fundamental Knowledge
10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 46	46	46
K/A # 013.A2.04 ESF Actuation System	Tier #	2	2
Ability to predict the impact of a loss of instrument bus on ESFAS.	Group #	1	1
	Importance Rating	3.6	4.2

Proposed Question:

A loss of VIAC 2 occurs. The operators verify that the plant is still stable at 100% power, and send a PEO out to investigate.

Which of the following signals, setpoints and coincidences will cause a main steam isolation (MSI) signal during current plant conditions?

Answers

A.	Correct	HI-2 containment pressure signal greater than 18 psia on 1 of 2 remaining channels.
B.	Wrong	Hi-3 containment pressure signal greater than 23 psia on 1 of 3 remaining channels.
C.	Wrong	Low steam line pressure signal less than 1092 psig on 1 of 3 remaining channels on 1 of 4 steam generators.
D.	Wrong	Hi steam line pressure negative rate signal 100 psig drop, 1 of 2 remaining channels on 1 of 4 steam generators.

Explanation (Optional): The loss of VIAC 2 deengergizes one channel of inputs to each of the MSI signals, reducing the required trip signals by one.
Hi-2 containment pressure (normally 2 of 3 channels) results in MSI signal (A correct)
Hi-3 causes containment spray and CIB (B wrong)
Setpoint for MSI is 660 psig on 2/3 on 1/4 steam generators. 1092 psig is the steam dump pressure setpoint (C wrong). Hi negative rate MSI is not active above P-11 (D wrong).

Technical Reference(s): Functional Sheets 7 and 8 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05493 Describe the operation of the following RPS controls and interlocks:... Steamline Isolation Signals... (As available)

Question Source: Modified Bank # 0069410 (Note changes or attach parent)

Question History: Seen on previous test prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5 / 43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 47	47	
K/A # 015.K4.08 Nuclear Instrumentation System	Tier #	2	
Knowledge of NIS interlocks that provide for automatic	Group #	1	
rod motion on demand signals	Importance Rating	3.4	3.7

Proposed Question:

Initial conditions:
- Reactor is at 100% power.
- Rod Control is in automatic.

One of the power range nuclear instruments rapidly fails high.

Which of the following describes the expected control rod and plant response?

Answers

A.	Wrong	Rods move in until the power mismatch rate signal decays, then move out to the original position to correct the temperature error.
B.	Correct	Rods move in until the power mismatch rate signal decays, then remain at the new position with a reduced Tave.
C.	Wrong	Rods move out until the power mismatch rate signal decays, then remain at the new position with an increased Tave.
D.	Wrong	Rods move out until the power mismatch rate signal decays, then move in to the original position to correct the temperature error.

Explanation (Optional): The power mismatched signal (difference in the rate of change between reactor and turbine load) will initially cause rods to drive in. As rods drive in, Tave decreases. Eventually, the mismatch signal decays, and C-2 (>103%, 1/4) prevents rods from moving out as would normally occur as a result of the reduced Tave.

Technical Reference(s): Functionals sheet 9 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05229 For the following conditions, determine the effects on the NIS system and on interrelated systems:... Power range instrument failure... (As available)

Question Source: Bank # 0064983

Question History: Previous Quiz / Test

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 48	48	
K/A # 015.A1.03 Nuclear Instrumentation System	Tier #	2	
Ability to predict / monitor changes in NIS power indication	Group #	1	
to prevent exceeding design limits	Importance Rating	3.7	3.7

Proposed Question:

During a significant feed heater level transient, HI-HI levels are received in all 3 first point feed heaters and extraction steam isolates to the first point heaters. The following indications exist in the control room:

- Electrical output has dropped by 15 Mwe.
- Tcold has dropped by 2°F.
- Tave is being maintained 2°F higher than Tref.
- NIS power has increased to 102%.
- An OPΔT runback commences.

What is the relationship between NIS indicated power and actual reactor power?

A. Wrong NIS Power indicates higher than actual power due to higher Tav.

B. Wrong NIS Power indicates lower than actual power due to higher Tav.

C. Wrong NIS Power indicates higher than actual power due to lower Tcold.

D. Correct NIS Power indicates lower than actual power due to lower Tcold.

Explanation (Optional): Tcold in the vessel downcomer has a greater effect on neutron leakage than Tav (lesson learned from Comanche Peak event, 1996), so with colder Tcold, less neutron leakage exists. This is supported in this question by diverse indications of high power: higher indicated ΔT and an OPΔT runback.

Technical Reference(s): NRC IN 96.41 Comanche Peak Event, 1996 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-06286 Describe how familiarity with and use of Operational Experience can mitigate or preclude an event. (As available)

Question Source: Bank # 0071059

Question History: Not seen in program

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 49	49	
K/A # 015.GEN.2.1.28 Nuclear Instrumentation System	Tier #	2	
Knowledge of the purpose and function of major system components and controls.	Group #	1	
	Importance Rating	3.2	3.3

Proposed Question:

While responding to a failed NIS Power Range channel, the crew operates the "Power Mismatch Bypass Switch" at the NIS Cabinet.

The Power Mismatch Bypass Switch defeats Power Range Input to which of the following?

Answers

A.	Correct	Rod Control Unit and the feed regulating bypass valves.
B.	Wrong	Overpower Rod Stop logic.
C.	Wrong	Channel Deviation alarm .
D.	Wrong	High flux Deviation/Auto Defeat alarms on Main Board 4.

Explanation (Optional): Power Mismatch Bypass Switch allows the removal of a failed (or under test) channel from the rod control circuit and the Steam Generator Water Level Control System. (A correct). Rod stop bypass switches (2) allow the bypassing of power range channel input to the overpower rod stop interlock. (B wrong). The Comparator Channel Defeat switch removes the failed channel from input to the Channel Deviation Alarm ("C" wrong). The UPPER (LOWER) SECTION switch removes a single faulty upper (lower) section power range channel to the Upper (lower) Deviation/Auto Defeat alarm. (D incorrect)

Technical Reference(s): AOP 3555 INSTRUMENT FAILURE (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05225 DESCRIBE THE OPERATION OF NIS SYSTEM CONTROLS:... Power mismatch bypass... (As available)

Question Source: Bank # 0069051
Question History: Previous Quiz / Test
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 50	50	50
K/A # 017.K6.01 Incore Temperature Monitoring	Tier #	2	2
Knowledge of the effect of a loss or malfunction	Group #	1	1
of incore temperature sensors.	Importance Rating	2.7	3.0

Proposed Question:

A loss of VIAC 1 occurs, resulting in the 'A' Train Inadequate Core Cooling/RVLMS cabinet being deenergized.

How will the Plant Process Computer respond?

Answers

A.	Wrong	All CETs and both trains of RVLMS will have 'X' quality tags indicated.
B.	Wrong	All CETs and both trains of RVLMS will still indicate properly.
C.	Wrong	Half of all CETs and both trains of RVLMS will have 'X' quality tags indicated.
D.	Correct	Half of all CETs, and one train of RVLMS will have 'X' quality tags indicated.

Explanation (Optional): Each ICCM/RVLMS cabinet processes 1/2 of all CETs, and one train of RVLMS. If the cabinet is deenergized, the data is not transmitted via the fiber-optics relay to the PPC. The PPC will indicate 'X' tags for the bad inputs.

Technical Reference(s): OP 3301K, Attachment. 1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04833 For the following malfunctions, partial or complete, of the ICC system, determine the effects on the system and on interrelated systems: A. Loss of Power... (As available)

Question Source: Bank # 0068916
Question History: Previous Quiz / Test
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 51	51	51
K/A # 022.K4.03 Containment Cooling	Tier #	2	2
Knowledge of design features and / or interlocks	Group #	1	1
which provide for automatic CTMT isolation.	Importance Rating	3.6*	4.0

Proposed Question:

A valid CIA signal occurs.

Which of the following loads, normally supplied by Reactor Plant Chilled Water (CDS), will now be cooled by RPCCW?

Answers

A.	Wrong	"A" and "B" CAR fans and CRDM shroud cooling
B.	Correct	Neutron shield tank cooler and "A" and "B" CAR fans
C.	Wrong	Neutron shield tank cooler and RCP Motor Air Coolers.
D.	Wrong	CRDM shroud cooling and RCP motor air coolers.

Explanation (Optional): On a CIA, CDS isolates to CTMT, and 3CCP*MOV222-229 open to supply RPCCW to the "A" and "B" CAR fans and Neutron Shield Tank coolers. CRDM shroud coolers and RCP motor air coolers lose cooling.

Technical Reference(s): P&ID 122A and 122B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04188 Describe operation of the reactor plant chilled water system under the following normal, abnormal, and emergency conditions: ... c. Receipt of a CIA signal. (As available)

Question Source: Bank # 0064873
Question History: Previous Quiz / Test
Question Cognitive Level: Memory or Fundamental Knowledge
10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 52	52	52
K/A # 022.A2.06 Containment Cooling System	Tier #	2	2
Ability to predict the impact of a loss of CTMT cooling pump,	Group #	1	1
and use procedures to correct or mitigate the consequences.	Importance Rating	2.8*	3.2*

Proposed Question:

With the plant at 100% power, one of the two running Reactor Plant Chilled Water (CDS) pumps trips, resulting in one of the running chillers to trip as well.

What will be the first concern for the crew?

A. Wrong Reaching a CTMT temperature Technical Specification limit.

B Correct Reaching a CTMT pressure Technical Specification limit.

C. Wrong Overheating RCPs

D. Wrong Overheating CRDMs

Explanation (Optional): As CDS heats up, CTMT temperature increases, which raises CTMT pressure. CTMT pressure has much less margin than temperature before Tech Specs require action. RCPs and CRDMs will not experience immediate problems, since the associated coolers cool the hot air exhausting from these heat loads. Recent Millstone 3 chiller trip event confirms this answer.

Technical Reference(s): P&ID 122A and 122B (Attach if not previously provided)
Millstone 3 CR

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04189 Given a failure, partial or complete, of the reactor plant chilled water system, determine effects on the system and on interrelated systems. (As available)

Question Source: New
Question History: None
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5
55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 53	53	53
K/A # 056.A2.04 Condensate System	Tier #	2	2
Predict the impact of a loss of condensate pumps,	Group #	1	1
and use procedures to mitigate the consequences.	Importance Rating	2.6	2.8*

Proposed Question:
With the plant at 100% power, one of the running Main Condensate pumps trips. Operators attempt to start the standby pump, but it does NOT start.

What impact will this have on plant operation?

A. Wrong — Feed pump discharge pressure will drop, and the Motor Driven Main Feed pump will auto-start on low feed pump discharge header pressure. This will restore feed header pressure to normal.

B. Wrong — Feed pump suction pressure will drop, and the Motor Driven Main Feed pump will auto-start on low feed pump suction pressure. This will restore feed header pressure to normal.

C. Wrong — Feed pump discharge pressure will drop, and all Main Feed pumps will trip on low feed pump discharge pressure. This will result in a LO-LO SG Level reactor trip.

D. Correct — Feed pump suction pressure will drop, and all Main Feed pumps will trip on low feed pump suction pressure. This will result in a LO-LO SG Level reactor trip.

Explanation (Optional): The motor driven main feed pump has an AUTO-START feature on low feed pump discharge header pressure. All 3 Main Feed pumps have a trip on low feed pump suction pressure after a time delay.
With only 1 condensate pump running, insufficient feed pump suction pressure will lower discharge pressure, and feed pump speed control will speed up the turbine driven main feed pumps, lowering suction pressure even more. The MDMFP may start on low discharge pressure, but this will only lower the suction pressure even more. The feed pumps will trip on low suction pressure, resulting in a reactor trip.

Technical Reference(s): LSKs (Attach if not previously provided)
Proposed references to be provided to applicants during examination: None
Learning Objective: MC-04235 GIVEN A FAILURE, PARTIAL OR COMPLETE, OF THE MAIN CONDENSATE,... DETERMINE THE EFFECTS ON... ON INTERRELATED SYSTEMS. (As available)

Question Source: New
Question History: None
Question Cognitive Level: Comprehension or Analysis
10 CFR Part 55 Content: 55.41.5 / 43.5
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 54	54	54
K/A # 059.A1.07 Main Feedwater System	Tier #	2	2
Ability to predict and / or monitor changes in perameters to prevent	Group #	1	1
exceeding design limits associated with feed pump speed control.	Importance Rating	2.5*	2.6*

Proposed Question:

With the plant at 48% power, the crew is placing the second Turbine Driven Main Feed Pump 3FWS-P1B in service. While the BOP operator was raising feed pump speed using the manual speed control switch 3TFC-M1B, turbine speed stopped increasing at approximately 2200 rpm. The BOP then raised the manual speed control switch to the high speed stop.

How should the BOP operator continue to raise "B" TDMFP speed?

Answers

A.	Wrong	Depress the RAISE pushbutton on the feed pump master speed controller 3FWS-SK509B.
B.	Correct	Take the Dahl controller 3FWS-SK46B toggle to the RAISE direction.
C.	Wrong	Adjust the Dahl 3FWS-SK46A bias control knob to above zero.
D.	Wrong	Energize the "B" TDAFW pump hydraulic jack by taking the selector switch at Main Board 5 to ON.

Explanation (Optional): The lower set of the Dahl speed controller and the manual speed controller controls feed pump speed. The low speed switch for the Dahl takes control at about 2200 rpm, after which the manual control is taken to the high speed stop to allow full range of control by the Dahl controller. "A" is wrong since the master speed controller is used when both TDMFPs are in auto. "C" is wrong since bias is used to balance flows after both pumps are in service, and "D" is wrong since the hydraulic jack is used to push the auto speed controller out of the way on a speed control failure, to allow manual control.

Technical Reference(s): OP 3321 Steps 4.4.34 and 35 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: Mc-04663 DESCRIBE the operation of... Main Feedwater (during) Normal At-Power Operations while increasing or decreasing power between 25 & 100%. (As available)

Question Source: Modified Bank # 0069863

Question History: Seen in program prior to modification

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 55	55	55
K/A # 061.K5.01 Auxiliary Feedwater System	Tier #	2	2
Knowledge of operational implications of the	Group #	1	1
relationship between AFW flow and RCS heat transfer.	Importance Rating	3.6	3.9

Proposed Question:

PLANT CONDITIONS:

- A reactor trip has occurred.
- The crew has entered EOP 35 ES-0.1, REACTOR TRIP RESPONSE.
- Steam Generator pressures are approximately 990 psig and slowly decreasing.
- Tave is 545°F and slowly decreasing.
- RCS pressure is 2020 psia and slowly decreasing.

What action should be taken by the crew to address the cooldown?

Answers

A.	Correct	Throttle AFW flow.
B.	Wrong	Commence immediate boration.
C.	Wrong	Initiate SI and return to step 1 of E-0.
D.	Wrong	Close the MSIVs and MSIV bypass valves.

Explanation (Optional): The balance of plant operator may, at any time when not required to be performing an immediate action or sequenced steps, throttle AFW flow if minimum heat sink requirements are satisfied. This includes the following:

Isolating AFW flow to a faulted SG
Throttling flow to minimize RCS cooldown

Immediate boration and MSLI are required at step 1 of ES-0.1 if the cooldown causes Tave to decrease to 530°F and then below 530°F .

Technical Reference(s): OP3272 EOP USER GUIDE Attachment 3; ES-0.1 REACTOR TRIP RESPONSE, step 1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04454 STATE THE CONDITIONS WHICH WOULD ALLOW THE ACTION OF EITHER THE THROTTLING OR ISOLATION OF AUXILIARY FEED WATER FLOW TO A STEAM GENERATOR OR STEAM FLOW FROM A STEAM GENERATOR PRIOR TO BEING DIRECTED TO PERFORM THE ACTION BY A SPECIFIC STEP WITHIN THE EMERGENCY OPERATING PROCEDURE NETWORK. (As available)

Question Source:	Bank # 0070200
Question History:	Previous Quiz / Test
Question Cognitive Level:	Comprehension or Analysis
10 CFR Part 55 Content:	55.41.5
Comments:	

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 56	56	
K/A # 061.K1.03 Auxiliary Feedwater System	Tier #	2	
Knowledge of the physical connections and / or cause-effect	Group #	1	
relationships between the AFW and Main Steam systems.	Importance Rating	3.5	3.9

Proposed Question:

Given the following situation:

- The "D" Steam Generator is faulted outside of Containment upstream of the MSIVs.
- Both MDAFW Pumps are running.
- All 3 steam supply valves (3MSS*AOV31) to the TDAFW Pump turbine are open.
- All 4 MSIVs and bypass valves are closed.
- The crew is performing the actions to isolate the faulted "D" SG per E-2 FAULTED STEAM GENERATOR ISOLATION, step 4.

Which of the following actions ~~concerning~~ the TDAFW pump steam supply ~~should~~ must be taken?

Answers

A.	Wrong	No action is required, since the "D" SG does not supply the TDAFW Pump turbine.
B.	Wrong	No action is required, since the TDAFW Pump steam supply lines are downstream of the MSIVs.
C.	Wrong	Stop the TDAFW pump by isolating all 3 steam supply paths.
D.	Correct	Close the TDAFW pump steam supply isolation valve from the faulted "D" SG.

Explanation (Optional): E-2 has the operators isolate the TDAFW Pump from only the faulted SG ("D" correct, "C" wrong). The TDAFW Pump steam supply lines come from the "A", "B", and "D" SGs upstream of the MSIVs ("A" and "B" wrong)

Technical Reference(s): P&ID 123A (Attach if not previously provided)
EOP 35 E-2 FAULTED SG ISOLATION step 4

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04366 DESCRIBE THE MAJOR ACTION CATEGORIES WITHIN EOP 35 E-2 (As available)

Question Source: Modified Bank # 0064963 (Note changes or attach parent)

Question History: Previous Test prior to modification

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.2 to 41.9

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 57	57	57
K/A # 068.A3.02 Liquid Radwaste System	Tier #	2	2
Ability to monitor automatic isolation of the	Group #	1	1
Liquid Radwaste System	Importance Rating	3.6	3.6

Proposed Question:

Which of the following radiation monitors monitors for releases from Unit 3 and has automatic actions associated with it?

Answers

A.	Wrong	3HVR*RE10A, Reactor Plant Ventilation Exhaust Monitor.
B.	Wrong	3HVR-RE19B, SLCRS Exhaust to Unit 1 Stack.
C.	Wrong	3SWP-RE60B, "B" RSS Heat Exchanger Service Water Outlet Monitor.
D.	Correct	3LWS-RE70, Liquid Rad Waste Discharge Monitor.

Explanation (Optional): 3LWS-RE70 trips the liquid waste discharge isolation valve 3LWS-HV77 on high radiation.

Technical Reference(s): AOP 3573 Radiation Response (Attach if not previously provided)
Tech Spec LCO 3.3.3.9

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05467 Describe the operation of the following Radiation Monitoring System Radiation Monitor Controls and interlocks:... LWS-RE70... (As available)

Question Source: New
Question History: None
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 58	58	58
K/A # 071.K5.04 Waste Gas Disposal System	Tier #	2	2
Knowledge of the operational implication of the relationship	Group #	1	1
of hydrogen / oxygen concentrations to flammability	Importance Rating	2.5	3.1

Proposed Question:

The primary rounds log has a daily check of Process Gas O2 Monitor 3GWS-AI82. This verifies that oxygen concentration is less than 2% at the Process Gas Receiver exhaust.

What is the purpose of this check?

A. Wrong Verify that backflow of radioactive gas from the Unit 1 stack is not occurring.

B. Wrong Minimize area radiation due to Oxygen 17 decay.

C. Correct Ensure that flammable concentrations of hydrogen and oxygen do not exist.

D. Wrong Minimize corrosion in the process gas receiver.

Explanation (Optional): Most of the gas removed by the degassifyer is hydrogen, and oxygen concentration must be kept less than the flammable limit.

Technical Reference(s): OP 3337 RAD GASSEOUS WASTE, Section 1.2 (Attach if not previously provided)
SP 3670.3-10 PRIMARY ROUNDS

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04729 Describe the major administrative or procedural precautions and limitations placed on the operation of the GWS system, including the basis for each. (As available)

Question Source: New
Question History: None
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 59	59	
K/A # 072.K3.02 Area Radiation Monitoring System	Tier #	2	
Knowledge of the effect that a loss or malfunction of	Group #	1	
the ARM system will have on fuel handling operations	Importance Rating	3.1	3.5

Proposed Question:

The plant is in MODE 1. Spent Fuel is being transferred from one location in the fuel pool to another location in the fuel pool.

The alarm circuitry for one of the Fuel Pool area monitors fails. I&C is investigating. No other operator actions have been taken.

Which of the following describes the required ACTION, if any, to be taken regarding the fuel movement in progress?

A. Wrong — No ACTION required, all LCOs are satisfied, fuel movement may continue.

B. Wrong — Fuel movement may continue for up to 4 hours while repairing the failed instrument.

C. Wrong — Fuel movement may continue for up to 72 hours.

D. Correct — Fuel movement must be suspended until an appropriate portable monitor is provided.

Explanation (Optional):

"A" is wrong since Tech Spec minimum channels required is 2, currently only 1.

"B" is wrong since the setpoint is not the problem, the 4 hour limit does not apply.

"C" is wrong since ACTION required is to provide the backup of suspend fuel movement.

"D" correct. Until the backup is provided, no fuel movement can occur, then the monitor must be returned to OPERABLE status in 30 days or suspend fuel movement.

Technical Reference(s): Tech Spec 3.3.3.1, ACTION 28 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05472 Given a failure of the Radiation Monitoring System (partial or complete), determine the effects on the system and on inter-related systems. (As available)

Question Source: Modified from 97 NRC exam

Question History: Modified from Millstone 3 NRC Exam (97)

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 60	60	60
K/A # 002.K4.01 Reactor Coolant System	Tier #	2	2
Knowledge of RCS design features or interlocks	Group #	2	2
that provide for filling or draining the RCS	Importance Rating	2.7	3.0

Proposed Question:

The plant is in MODE 5 after completing a refueling outage. The crew has drained the RCS to mid-loop conditions using OP 3270A REDUCED INVENTORY OPERATION in order to perform emergent work on a leaking RCS loop stop valve. The "A" train of RHR is in service with 1,000 gpm flow through RHR heat exchanger flow control valve 3RHS*HCV606.

An unexplained increase in RCS temperature is occurring, and the RO attempts to increase cooling flow by throttling open on the RHR heat exchanger flow control valve 3RHS*HCV606.

What will happen to RHR flow through the "A" RHR heat exchanger?

A. Correct — Flow will remain the same since a stem locking device has been installed on 3RHS*HCV606 that limits flow to 1,000 gpm.

B. Wrong — Flow will remain the same since power has been removed to 3RHS*HCV606 with flow set to 1,000 gpm.

C. Wrong — Flow will increase to a maximum of 4,000 gpm, since this is the procedural flow limit while in reduced inventory operations.

D. Wrong — Flow will decrease since vortexing will occur in the RHR suction piping from the RCS loop hot leg.

Explanation (Optional): RHR flow is limited in reduced inventory operations by throttling flow through the RHR flow control valves to 1,000 gpm, after which stem locking devices are placed on the flow control valves.

Technical Reference(s): OP 3270A steps 4.2.8 to 4.2.11. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05455 DESCRIBE THE OPERATION OF THE RHR SYSTEM EQUIPMENT CONTROLS AND INTERLOCKS:... RHR HEAT EXCHANGER FLOW CONTROL VALVES ... (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 61	61	61
K/A # 006.K2.01 Emergency Core Cooling System (ECCS)	Tier #	2	2
Knowledge of bus power supplies to the ECCS pumps	Group #	2	2
	Importance Rating	3.6	3.9

Proposed Question:

The plant is at 100% power in a normal electrical lineup. The "A" RHR pump is running for a surveillance run.

Which of the following describes the power supply path for the "A" RHR pump if a fast transfer occurs on the "A" train?

Answers

A. Correct
- NSST "A" FEEDER - OPEN
- 34A/34C Bus Tie - CLOSED
- RSST "A" FEEDER - CLOSED

B. Wrong
- NSST "A" FEEDER - OPEN
- 34A/34C Bus Tie - OPEN
- RSST "A" FEEDER - CLOSED

C. Wrong
- NSST "A" FEEDER - CLOSED
- 34A/34C Bus Tie - CLOSED
- RSST "A" FEEDER - OPEN

D. Wrong
- NSST "A" FEEDER - CLOSED
- 34A/34C Bus Tie - OPEN
- RSST "A" FEEDER - OPEN

Explanation (Optional): Fast transfer occurs when the NSST breaker opens ("C" and "D" wrong). The cross tie opens on a slow transfer, but remains closed on a fast transfer ("B" and "D" wrong).

Technical Reference(s): LSK 24-3D (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03333 Describe the operation of 4kV Distribution System controls and interlocks:... Fast Transfer... (As available)

Question Source: Modified Bank # 0068074

Question History: Previous Test prior to modification

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 62	62	
K/A # 010.A1.06 PZR Pressure Control System	Tier #	2	
Ability to predict and / or monitor changes in	Group #	2	
pressure due to RCS heatup and cooldown	Importance Rating	3.1	3.2

Proposed Question:

A rapid load reduction is being performed from 100% power. Shortly after the downpower is commenced, the pressurizer backup heaters energize even though spray valves are open.

Which of the following describes why the heaters are energized?

Answers

A.	Wrong	The pressurizer pressure controller is responding to the rate/lag compensated pressure channel inputs.
B.	Wrong	The controlling pressure channel has failed low.
C.	Wrong	The pressurizer level controller is responding to a greater than 5% outsurge from the downpower.
D.	Correct	The pressurizer level controller is responding to a greater than 5% insurge from the downpower.

Explanation (Optional): The downpower will cause RCS temperature to increase due to a decrease in heat removal. This will cause RCS water to expand, resulting in an insurge to the pressurizer, so both PZR pressure and level will increase. The increase in pressure causes spray valves to open, and when pressurizer level increases by 5%, the heaters will energize ("D" is correct, "C" is wrong). The reason for this is that the temperature of the insurging water is not as hot as the pressurizer water, and if an outsurge follows with the pressurizer water at less than saturation temperature, RCS pressure could rapidly drop. "A" and "B" are wrong since backup heaters cycle around 2225 to 2233 psia, and spray valves cycle around 2275 to 2325 psia, and shouldn't both be on together based on pressure.

Technical Reference(s): Functional Sheet 11 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05341 DESCRIBE THE OPERATION OF THE PRESSURIZER PRESSURE AND LEVEL CONTROL SYSTEM UNDER NORMAL, ABNORMAL, AND EMERGENCY OPERATING CONDITIONS. (As available)

Question Source: Bank # 0068619

Question History: Previous Quiz / Test

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 63	63	63
K/A # 011.K3.01 PZR Level Control System	Tier #	2	2
Knowledge of the effect that a loss or malfunction	Group #	2	2
of the PZR LCS will have on CVCS	Importance Rating	3.2*	3.4

Proposed Question:

Pressurizer level transmitter LT459 is selected for control when its variable leg develops a leak near the transmitter.

Which of the following describe anticipated instrument or plant response?

	LT-459 PZR Level Indication	LT-460 & 461 PZR Level Indication	VCT Level
Answers			
A. Wrong	Increasing	Decreasing	Increasing
B. Wrong	Decreasing	Increasing	Increasing
C. Wrong	Increasing	Decreasing	Decreasing
D. Correct	Decreasing	Increasing	Decreasing

Explanation (Optional): A variable leg leak will decrease pressure sensed by the process side of the LT. This will appear as an decreased level in the PZR on channel 459. FCV 121 will throttle open to restore level. Increased charging will cause actual level will increase (460 & 461), and VCT level to decrease. only "A" is correct.

Technical Reference(s): Functional Drawing Sheet 11 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05342 GIVEN A FAILURE, PARTIAL OR COMPLETE, OF THE PRESSURIZER PRESSURE AND LEVEL CONTROL SYSTEM, DETERMINE THE EFFECTS ON THE SYSTEM AND ON INTERRELATED SYSTEMS. (As available)

Question Source: Modified bank # 0064307
Question History: Seen in program prior to modification
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 64	64	64
K/A # 012.A4.05 Reactor Protection System	Tier #	2	2
Ability to operate and / or monitor channel defeat	Group #	2	2
in the control room	Importance Rating	3.6	3.6

Proposed Question:

With the plant at 100% power, power range channel N41 fails low.

How are power range N41 HI FLUX and RATE TRIP bistables placed in the trip condition?

A. Correct — The control power fuses are removed from the Power Range N41 drawer.

B. Wrong — The instrument power fuses are removed from the Power Range N41 drawer.

C. Wrong — The Comparator Channel Defeat switch is taken to the N41 position at the Comparator and Rate Drawer.

D. Wrong — An I&C technician trips the bistables from the instrument rack room.

Explanation (Optional): Removing control power fuses deenergizes the control power signal to RPS, providing a "trip" signal.

Technical Reference(s): AOP 3571 INSTRUMENT FAILURE RESPONSE (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05229 For the following conditions, determine the effects on the NIS System... G. Power Range instrument failure... (As available)

Question Source: Bank # 0069056
Question History: Not seen in program
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 65	65	
K/A # 014.A2.03 Rod Position Indication System	Tier #	2	
Ability to predict the impact of a dropped rod on the RPI	Group #	2	
system. Use procedures to mitigate the consequences	Importance Rating	3.6	4.1

Proposed Question:

Control Bank "D" rods were at 200 steps when one of the Bank "D", Group 1 rods dropped. The crew has entered AOP 3552 MALFUNCTION OF THE ROD DRIVE SYSTEM, and is currently recovering the dropped rod.

During the recovery of the rod, a "Bank D Full Rod Withdrawal" alarm is received on MB4C.

Which of the following describes the appropriate response by the crew?

A. Wrong — Stop the recovery and check the rod disconnect switches. Another Bank D rod is likely moving.

B. Wrong — Stop the recovery and match Tave to Tref. Verify SHUTDOWN MARGIN is adequate.

C. Wrong — Continue the alignment. This annunciator is expected since the bank overlap unit still receives the outward demand signal.

D. Correct — Continue the alignment. This annunciator is expected since the P/A converter still receives the outward demand signal .

Explanation (Optional): "D" is correct and "A" and "B" are wrong, since the affected rod is moving in the outward direction during the recovery and the P/A converter still receives the demand signal. After rod recovery, the P/A converter will be reset using AOP 3552, Attachment E. "C" is wrong since the bank overlap unit is frozen while in "Bank Select".

Technical Reference(s): AOP 3552 Malfunction Of The Rod Drive System (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-000015 Given one of the below listed failures (partial or complete) of the Rod Control System, determine the effects on the system and on interrelated systems:... Dropped Rod... (As available)

Question Source: Bank # 0065066

Question History: Not seen in program

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5 / 43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 66	66	66
K/A # 016.A2.01 Non-Nuclear Instrumentation	Tier #	2	2
Ability to predict the impact of a detector failure,	Group #	2	2
and use procedures to mitigate the consequences	Importance Rating	3.0*	3.1*

Proposed Question:

Plant operating at 100% power.

Loop 1 narrow range Thot fails HIGH.

Which of the statements represents the response of loop 1 OPΔT setpoint, OTΔT setpoint and indicated ΔT?

Answers

A. Wrong
- OPΔT setpoint DOES NOT CHANGE.
- OTΔT setpoint DECREASES.
- Indicated ΔT DECREASES.

B. Wrong
- OPΔT setpoint DECREASES.
- OTΔT setpoint DOES NOT CHANGE.
- Indicated ΔT INCREASES.

C. Correct
- OPΔT setpoint DECREASES.
- OTΔT setpoint DECREASES.
- Indicated ΔT INCREASE.

D. Wrong
- OPΔT setpoint INCREASES.
- OTΔT setpoint INCREASES.
- Indicated ΔT DECREASES.

Explanation (Optional): If Thot fails high, DT will be high (difference between Thot and Tcold) ("A" and "D" wrong). Tech Spec section 2 gives the equation for OP and OTDT. T in constants K5 and K6 increases which subtracts from the OPDT setpoint - indicates potentially increased power production ("A", "B", and "D" wrong). Conditions indicate closer to DNB concerns (calculation for K2 is a larger number which is subtracted from K1 OTDT decreases) ("B" and "D" wrong)

Technical Reference(s): Tech spec bases 2.0 (Attach if not previously provided)
Process sheet 7

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05493 Describe the operation of the following RPS controls and interlocks:... OTDT, OPDT... (As available)

Question Source: Modified Bank # 0064304
Question History: Seen in program prior to modification
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5 / 53.5
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 67	67	67
K/A # 026.A3.02 Containment Spray System	Tier #	2	2
Ability to verify automatic operation of cooling	Group #	2	1
water supply to the CTMT spray heat exchanger.	Importance Rating	3.9*	4.2*

Proposed Question:

A CDA occurred and the crew is progressing through the EOP network. The CTMT Recirc (RSS) pumps have just started, and the RO is verifying that equipment is in the desired lineup.

What should be the position of the RPCCW heat exchanger service water inlet isolation valves (3SWP*MOV50A/B), and the service water inlet valves to the containment recirc coolers (3SWP*MOV54A/B/C/D)?

Answers

A.	Wrong	Both the RPCCW heat exchanger service water inlet isolation valves and the service water inlet valves to the containment recirc coolers should be OPEN.
B.	Wrong	The RPCCW heat exchanger service water inlet isolation valves should be OPEN and the service water inlet valves to the containment recirc coolers should be CLOSED.
C.	Correct	The RPCCW heat exchanger service water inlet isolation valves should be CLOSED and the service water inlet valves to the containment recirc coolers should be OPEN.
D.	Wrong	Both the RPCCW heat exchanger service water inlet isolation valves and the service water inlet valves to the containment recirc coolers should be CLOSED.

Explanation (Optional): On a CDA, the RPCCW heat exchanger service water inlet isolation valves receive a CLOSE signal and the service water inlet valves to the containment recirc coolers receive an OPEN signal. There is a 3 minute time delay prior to 3SWP-MOV54C opening, but since the RSS pumps are running, at least 11 minutes has passed since the CDA actuated.

Technical Reference(s): LSK 9-1G and 27-11L (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05718 Describe the operation of the Service Water System under the following normal, abnormal, and emergency conditions:... CDA... (As available)

Question Source: Modified Bank # 0069683 (Note changes or attach parent)

Question History: Seen in program prior to modification

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 68	68	68
K/A # 029.K4.03 CTMT Purge System	Tier #	2	2
Knowledge of the design feature and / or interlock	Group #	2	2
which provide for automatic purge isolation	Importance Rating	3.2*	3.5

Proposed Question:

Which automatic actions occur on high radiation inside containment as detected by RMS-41 or RMS-42?

Answers

A.	Wrong	If running, the CAR fans trip.
B.	Wrong	CTMT Isolation Phase "A" (CIA) actuates.
C.	Correct	The CTMT Purge Supply and Exhaust Valves close.
D.	Wrong	If running, the Containment Purge Fans trip.

Explanation (Optional): High radiation closes HVU*32A/B and 33A/B only. (C correct)

Technical Reference(s): AOP 3573 Attachment B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05467 Describe the operation of the following Radiation Monitoring System Radiation Monitor controls and interlocks: RMS-RE41/42... (As available)

Question Source: Bank # 0064315
Question History: Previous Quiz / Test
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 69	69	69
K/A # 033.K4.05 Spent Fuel Pool Cooling	Tier #	2	2
Knowledge of design features and / or interlocks which	Group #	2	2
provide for adequate shutdown margin (boron concentration)	Importance Rating	3.1	3.3

Proposed Question:

With the plant at 100% power, the seal fails in the gate between the spent fuel pool and the empty transfer canal. Level in the spent fuel pool starts to slowly decrease, and the "Fuel Pool Level Lo" annunciator comes in at MB1.

What will be the first source of makeup water supplied to the spent fuel pool?

A. Wrong Water will be manually made up from the primary grade water system.

B. Correct Water will be manually made up from RWST.

C. Wrong Water will be automatically made up from the primary grade water system.

D. Wrong Water will be automatically made up from the RWST.

Explanation (Optional): There is no automatic open signal for Primary Grade Water Makeup Valve 3SFC-LV44 to the spent fuel pool ("C" and "D" wrong). Primary grade water (PGS) makeup must be manually initiated, but has an auto stop on high level. By procedure, PGS should be used if the level loss is due to evaporation ("A" wrong). This prevents diluting the boron concentration of the fuel pool. The RWST should be used if the level loss is due to leakage ("B" correct).

Technical Reference(s): OP 3305 FUEL POOL COOLING AND PURIFICATION, section 4.12; LSK 34-1B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05641 Describe the operation of the following spent fuel pool cooling system controls and interlocks:... Spent fuel pool makeup valve (SFC-LV44) (As available)

MC-05642 Describe the major administrative or procedural precautions and limitations placed on the operation of the spent fuel pool cooling system, and the basis for each.

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 70	70	70
K/A # 035.GEN.2.1.7 Steam Generator System	Tier #	2	2
Ability to evaluate plant performance and make operational judgements based on operating characteristics.	Group #	2	2
	Importance Rating	3.7	4.4

Proposed Question:

The unit is at 25% power when the "A" MSIV inadvertently closes during partial stroke testing.

Assuming the reactor does not immediately trip, which of the following parameters would show an INITIAL DECREASE following the "A" MSIV closure?

Answers

A.	Correct	"A" Steam Generator level.
B.	Wrong	"A" RCS Loop Cold Leg temperature.
C.	Wrong	"B" RCS Loop ΔT.
D.	Wrong	Rod insertion limit.

Explanation (Optional): The "A" generator will initially shrink due to decreased steam demand ("A" correct). The "B", "C" and "D" generators will initially swell due to increased steam demand. Cold leg temperatures in the "B", "C" and "D" loops will decrease due to increased steam flow, increasing and RIL (based on auctioneered high ΔT("C" and "D" are incorrect).

Technical Reference(s): Westinghouse Transient Analysis Text (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05659 Given a failure of the SGS system or a portion of the system, determine the effects on the system and on interrelated systems. (As available)

Question Source: Modified Bank # 0069456
Question History: Seen in program prior to modification
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.5
Comments:

Loss of FW Heating Q Better?

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 71	71	71
K/A # 039.K5.08 Main and Reheat Steam System	Tier #	2	2
Knowledge of the operational implications of the effect	Group #	2	2
of steam removal on reactivity	Importance Rating	3.6	3.6

Proposed Question:

PARAMETER:	CURRENT VALUE:	TREND:
Reactor power	58%	Increasing
RCS pressure	2225 PSIA	Decreasing
Auctioneered high Tave	569°F	Decreasing
Turbine power	595 MWe	Decreasing
S/G NR levels	52%	Increasing
Steam pressure	1030 PSIG	Decreasing
Containment pressure	15 PSIA	Increasing

Based on the plant conditions, which of the following events is in progress?

Answers

A.	Wrong	Small LOCA
B.	Correct	Steamline break
C.	Wrong	Continuous rod withdrawal
D.	Wrong	Steam generator tube rupture

Explanation (Optional): Reactor power is increasing, indicating positive reactivity event ("A" and "D" wrong). Steam pressure and electric load is decreasing, indicating loss of steam to the turbine ("B" correct, "C" wrong).

Technical Reference(s): FSAR Chapter 15.1.3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04881 DESCRIBE the major parameter changes associated with increased heat removal by the Secondary System. (As available)

Question Source: Bank # 0064268

Question History: Previous Quiz / Test

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 72	72	
K/A # 055.K1.06 Condenser Air Removal System	Tier #	2	
Knowledge of relationship between Condenser	Group #	2	
Air Removal System and Radiation Monitoring	Importance Rating	2.6	2.6

Proposed Question:

The plant is operating at 100% power.
Blowdown from the "A" Steam Generator is isolated.
A large tube leak occurs in the "A" Steam Generator.

How will the Air Ejector Radiation Monitor, 3ARC-RE21, respond to this event?

Answers

A.	Wrong	A close signal will be sent to all Steam Generator blowdown flow control valves (BDG-HV20A-D).
B.	Wrong	No response; blowdown from the affected Steam Generator is isolated, so the monitor will not detect the event.
C.	Correct	No response; automatic functions associated with 3ARC-RE21 have been bypassed.
D.	Wrong	A close signal will be sent to all Steam Generator blowdown containment isolation valves (BDG*CTV22A-D).

Explanation (Optional): ARC-21 monitors the SJAE air ejector exhaust, therefore status of blowdown will not affect its monitoring ability ('A' incorrect). Upon generation of a HI-rad signal, ARC-21 will no longer isolate S/G blowdown CONTAINMENT ISOLATIONS ('C' correct, 'B', 'D' incorrect).

Technical Reference(s): AOP 3573 RAD MONITOR ALARM RESPONSE (Attach if not previously provided)
Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05293 Describe the operation of the following Radiation Monitoring System Radiation Monitor Controls and Interlocks:... 3ARC-RE21... (As available)

Question Source: Bank # 0060431
Question History: Previous Quiz / Test (New correct answer due to plant modification)
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.2 to 41.9
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 73	73	73
K/A # 062.A2.09 AC Distribution System	Tier #	2	2
Ability to predict the consequences of exceeding	Group #	2	2
current limitations	Importance Rating	2.7	3.0*

Proposed Question:

With the plant operating at 100% in a normal electrical lineup, the "Bus 34A Differential" alarm is received on MB8.

What will be the expected electrical distribution response as a result of the 34A differential?

Answers

A.	Correct	Bus 34A de-energizes, bus 34C slow transfers to the RSST.
B.	Wrong	34C fast transfer to the RSST, the tie breaker remains closed allowing 34A to remain energized.
C.	Wrong	Bus 34A de-energizes, bus 34C is powered from the "A" emergency diesel.
D.	Wrong	Bus 34A deenergizes, bus 34C fast transfers to RSST.

Explanation (Optional): Buses 34A/B differential overcurrent trips and locks out NSST feeder and bus tie breakers. This will result in slow transfer to the RSST

Technical Reference(s): LSK 24-3D (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03337 Describe the 4kV Distribution System operation under normal, abnormal and emergency conditions:... Main Board 8 Alarm Response... (As available)

Question Source: Bank # 0068085

Question History: Previous Quiz / Test

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.5
55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 74	74	74
K/A # 063.K3.01 DC Electrical Distribution	Tier #	2	2
Knowledge of the effect of a loss or malfunction	Group #	2	1
of DC will have on the EDGs.	Importance Rating	3.7*	4.1

Proposed Question:

The plant has tripped and the crew is in EOP 35 ES-0.1 REACTOR TRIP RESPONSE. Numerous MB8 annunciators are received and the BOP operator reports that the Battery 1 DC volt meter indicates zero volts.

How will the loss of DC Bus 301A-1 affect the "A" Emergency Diesel (EDG)?

A. Wrong The "A" EDG auto-started as soon and the DC bus was lost.

B. Wrong If an LOP occurs, the "A" EDG will not auto-start, but can still be started from MB8.

C. Correct The "A" EDG can only be started locally using the air start valve levers.

D. Wrong The "A" Train Sequencer is not energized.

Explanation (Optional): Control power is lost to "A" EDG components, and air start levers must be used to start the EDG ("B" and "D" are wrong, and "C" is correct). The "A" sequencer receives power from vital instrument AC power ("D" is wrong).

Technical Reference(s): AOP 3563 LOSS OF DC BUS POWER, Att A (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03947 Discuss the basis of major precautions, procedure steps, or sequence of steps (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 75	75	75
K/A # 064.K4.11 Emergency Diesel Generator	Tier #	2	2
Knowledge of the sequencer design features and / or interlocks	Group #	2	2
	Importance Rating	3.5	4.0

Proposed Question:
PLANT CONDITIONS:

* The "A" EGLS is in "Test 1"
* A "CDA" test is being conducted.
* Charging pump "A" is in "Test"
* All other components are in "Inhibit"
* The "B" Charging pump is running.

A valid "SIS" signal is received.

How will the "A" EGLS respond?

Answers

A.	Wrong	The EGLS sees both inputs, prioritizes CDA, and starts all equipment except charging pump "A".
B.	Wrong	The EGLS sees both inputs, prioritizes CDA, and starts only charging pump "A".
C.	Wrong	The EGLS comes out of CDA Test and responds to the SIS signal by starting all equipment except charging pump "A".
D.	Correct	The EGLS comes out of CDA Test and responds to the SIS signal by starting all equipment including charging pump "A".

Explanation (Optional): In Test 1, an actual external input signal will reset the sequencer to normal and respond to the valid signal; therefore, the Test/Inhibit switches will no longer be in effect.

Technical Reference(s): LSK 24-9.4B (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04416 Describe the operation of the emergency diesel load sequencers under the following normal, abnormal, and emergency conditions:...Test 1... (As available)

Question Source: Modified Bank # 0069204 (Note changes or attach parent)

Question History: Seen in program prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 76	76	76
K/A # 073.GEN.2.3.10 Process Radiation Monitoring	Tier #	2	2
Ability to perform procedures to reduce excessive levels	Group #	2	2
of radiation and guard against personnel exposure	Importance Rating	2.9	3.3

Proposed Question:

Approximately 1 hour ago, a radiation release to the environment occurred at MP3. Control Room Makeup Air Supply Radiation Monitors 3HVC-RE16A and B have alarmed, resulting in a CBI signal. Currently, the crew is aligning the Control Room Pressure Envelope Emergency Ventilation System for recirculation with outside filtered air.

What will be the relationship between control room pressure and atmospheric (outside air) pressure while in operation with recirculated outside filtered air?

Answers

A.	Wrong	Control Room pressure will be equal with outside air pressure.
B.	Correct	Control Room pressure will be greater than outside air pressure.
C.	Wrong	Control Room pressure will be at a set pressure independent of outside air pressure.
D.	Wrong	Control Room pressure will be less than outside air pressure.

Explanation (Optional): While on recirc with outside filtered air, a suction path is aligned to provide filtered outside air to the control room pressure envelope. No exhaust path is aligned, thus maintaining a positive pressure, minimizing inleakage from outside air.

Technical Reference(s): OP 3314F Control Building Heating, Ventilation, Air Conditioning and Chill Water step 4.10.1 NOTE (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04763 Describe operation of HVC/HVK systems under the following normal, abnormal, and emergency operation conditions:... High radiation detected by HVC*RE16A or B (As available)

Question Source: Bank # 0058746

Question History: Previous Quiz / Test

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.4

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 77	77	
K/A # 075.A2.03 Circulating Water System	Tier #	2	
Ability to predict the impact of safety features and relationship	Group #	2	
between condenser vacuum, turbine trip, and steam dump	Importance Rating	2.5	2.7*

Proposed Question:

What is the purpose of manually tripping the circ water pumps on a containment depressurization actuation signal?

Answers

A.	Correct	To prevent pump damage due to the loss of lube water.
B.	Wrong	To minimize plant electric load as the turbine is tripped.
C.	Wrong	To support the shutdown of unnecessary plant equipment.
D.	Wrong	Maximize Service Water flow to the ESF loads.

Explanation (Optional): CDA isolates SW to the Circ Water Pumps by closing MOV 115A & B. The Circ pumps are now running w/o lube water flow and should be shutdown to prevent damaging the pumps.

Technical Reference(s): P&ID 133D (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04337 DISCUSS THE BASIS OF MAJOR PROCEDURE STEPS AND/OR SEQUENCE OF STEPS IN EOP 35 E-0. (As available)

Question Source: Bank # 0069784

Question History: Previous Quiz / Test

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5
55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 78	78	
K/A # 079.A4.01 Station Air System	Tier #	2	
Ability to manually operate or monitor the	Group #	2	
cross tie valves with IAS from the control room	Importance Rating	2.7	2.7

Proposed Question:

The secondary rounds PEO reports an air leak on the instrument air ring header in the turbine building. The RO reports that instrument air header pressure is at 91 psig and decreasing slowly.

The RO is observing instrument air pressure for indications of service air to instrument air cross tie valve 3IAS-AOV14 opening and service air supply valve 3SAS-AOV33 closing.

If the added capacity of the service air compressor is required to compensate for the leak, how should instrument air header pressure respond prior to any local actions by PEOs?

Answers

A.	Wrong	IAS pressure will continue to drop, since local actions by a PEO is required to align 3IAS-AOV14 and 3SAS-AOV33 to supply instrument air.
B.	Wrong	When IAS header pressure lowers to 85 psig, pressure may start to recover since 3IAS-AOV14 opens. If not, pressure will recover at 80 psig when 3SAS-AOV33 closes. Pressure will then cycle between 80 and 85 psig.
C.	Correct	When IAS header pressure lowers to 85 psig, pressure will start to recover as both valves realign. Pressure will start to drop again should IAS header pressure increase to 103 psig, since the valves will realign to their original positions.
D.	Wrong	When IAS header pressure lowers to 85 psig, pressure will start to recover as both valves realign. Pressure will start to drop again should IAS header pressure increase to 110 psig, since the running instrument air compressors will unload.

Explanation (Optional): Pressure switch 3IAS-PS14, which senses IAS common header pressure downstream of the IAS receivers, will cause AOV14 to open, and simultaneously cause AOV33 to close when pressure lowers to 85 psig ("A" and "B" wrong). Additionally, when IAS header pressure increases to 103 psig, PS14 will automatically realign the AOV's to their normal positions, and pressure will again start to decrease since the leak has not been isolated ("C" is correct and "D" is wrong).

Technical Reference(s): LSK-12-1C, 12-2C (Attach if not previously provided)
OP 3353.IS, 1-1 ANNUNCIATOR RESPONSE

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05321 Describe the operation of the following plant air system components control and interlocks: ...Service Air to Instrument Air cross-connect valve 3IAS-AOV14.

Question Source:	Bank # 0067323
Question History:	Previous Quiz / Test
Question Cognitive Level:	Comprehension or Analysis
10 CFR Part 55 Content:	55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 79	79	79
K/A # 086.K5.04 Fire Protection System Hazards to personnel as a result of fire type and methods of protection.	Tier #	2	2
	Group #	2	2
	Importance Rating	2.9	3.5*

Proposed Question:

A deep seated fire started 10 minutes ago in the computer room, and the Halon system automatically actuated. The crew desires to enter the computer room prior to ventilating the area in order to inspect for damage.

Which of the following is in accordance with the Halon related precautions of OP 3341B FIRE PROTECTION HALON SYSTEM?

A. Wrong The computer room may be ventilated now since ten minutes is adequate to ensure that a deep seated fire is out.

B. Correct A self contained breathing apparatus must be used for entry.

C. Wrong A filter type or canister mask may be used for entry.

D. Wrong The area may be entered alone.

Explanation (Optional): "A" is wrong since the space should be kept sealed for 30 to 60 minutes for a deep seated fire. "B" is correct and "C" and "D" are wrong since Halon and decomposition products decompose and form sharp, acrid byproducts.

Technical Reference(s): OP 3341B FIRE PROTECTION HALON SYSTEM Precautions 3.1, 3.2, and 3.3. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04565 Describe the major administrative or procedural precautions and limitations placed on the operation of the Halon Fire Protection (FPG) system, including the basis for each. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 80	80	80
K/A # 005.K1.10 Residual Heat Removal (RHR)	Tier #	2	2
Knowledge of physical connections and / or cause-effect relationship between RHR and CTMT spray	Group #	3	3
	Importance Rating	3.2	3.4*

Proposed Question:

A large break LOCA has occurred. While performing EOP 35 ES-1.3 TRANSFER TO COLD LEG RECIRCULATION, the crew has improperly performed a step and the RSS to RHR cross-connect valve 3RSS*MV8837B fails to open from MB2.

Which of the following conditions could be preventing 3RSS*MV8837B from opening?

Answers

A.	Wrong	The RHR to SI cross-connect valve (3RHS*MV8804B) is closed.
B.	Wrong	The RSS to RHR cross-connect valve (3RSS*MV8838B) is open.
C.	Correct	The RWST suction isolation valve (3RHS*MV8812B) is open.
D.	Wrong	RHR pump suction valve (3RHS*MV8702B) is closed.

Explanation (Optional): To open the B RSS to RHR cross connect:
the RWST suction isolation 3RHS*MV8812B must be closed ("C" correct) and at least one of the affected flowpath RHR loop suctions 3RHS*MV8702A/B/C must be closed ("A", "B", and "D" wrong).

Technical Reference(s): LSK 27-11C, note 2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04171 Describe the operation of the following RSS components , controls and interlocks...RSS Pump discharge Cross-Connect Valves (As available)

Question Source: Modified Bank # 0068764 (Note changes or attach parent)

Question History: Seen in program prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.2 to 41.9

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 81	81	81
K/A # 008.A1.01 Component Cooling Water CCW	Tier #	2	2
Ability to predict and / or monitor changes in CCW	Group #	3	3
flowrate to prevent exceeding design limits	Importance Rating	2.8	2.9

Proposed Question:

The plant is being cooled down per OP 3208 PLANT COOLDOWN.
The operating crew is preparing to align the "B" RHR train for cooldown.

The crew is directed to OP 3330A REACTOR PLANT COMPONENT COOLING WATER to align the RPCCW system for plant cooldown operations.

Aligning RPCCW for cooldown operations will help prevent exceeding:

Answers

A.	Correct	8100 gpm through the RPCCW heat exchanger.
B.	Wrong	RPCCW Containment header flow limit.
C.	Wrong	140°F on the RPCCW return line from the RHR heat exchanger.
D.	Wrong	RPCCW pump runout limit.

Explanation (Optional): 3CCP*E1A, 3CCP*E1B or 3CCP*E1C, RPCCW heat exchangers should not be operated at greater than 8,100 gpm shell side flow rates to avoid adverse tube vibration effects. To prevent an overload of the RPCCW heat exchangers, certain auxiliary load must be isolated when supplying RHR heat exchangers in accordance with this procedure.

Technical Reference(s): OP 3330A REACTOR PLANT COMPONENT COOLING Precaution 3.2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04152 Describe the major administrative or procedural precautions and limitations placed on the operation of the Reactor Plant Component Cooling System, and the basis for each. (As available)

Question Source: Modified Bank # 0060406
Question History: Seen in program prior to modification
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 82	82	
K/A # 027.K1.01 CTMT Iodine Removal CIR	Tier #	2	
Knowledge of physical connections and / or cause-effect relationships between CIR and CTMT Spray	Group #	3	
	Importance Rating	3.4*	3.7*

Proposed Question:

Trisodium phosphate (TSP) is stored in porous wire mesh baskets on the floor or in the sump of containment.

Why is it desirable to dissolve TSP in post-LOCA sump water?

A.	Wrong	Clean crud deposits from the RCS in order to minimize post-LOCA radiological hot spots.
B.	Correct	Raise CTMT sump water pH to minimize corrosion and ensure that radioactive iodine remains in solution.
C.	Wrong	Minimize radiolytic decomposition of CTMT sump water, lowering post-LOCA CTMT hydrogen concentration.
D.	Wrong	Reduce clogging of the ESF sump screens during long term recirculation of CTMT sump water.

Explanation (Optional): A low pH (acidic) solution assists the evolution of volatile iodine out of solution, and promotes stress corrosion cracking. TSP ensures that iodine remains in solution and raises pH.

Technical Reference(s): Tech Spec bases 3.5.5 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04167 Describe the function and location of the following... components: ...Trisodium phosphate storage baskets (As available)

Question Source: Bank # 0070657

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.2 to 41.9

Comments:

Examination Outline Cross-reference:

K/A # 028.A1.01 Hydrogen Recombiner and Purge System (HRPS)
Ability to predict and / or monitor changes in hydrogen concentration associated with operating the HRPS controls.

Level	RO	SRO
Question record # 83	83	83
Tier #	2	2
Group #	3	2
Importance Rating	3.4	3.8

Proposed Question:

Following a design basis LOCA, the "A" hydrogen recombiner is placed in service, but CTMT hydrogen concentration continues to increase.

Which of the following describes how hydrogen recombiner gas heater power requirements change as CTMT hydrogen concentration increases?

Answers

A.	Correct	Heater power will decrease as hydrogen concentration increases.
B.	Wrong	Heater power will increase as hydrogen concentration increases.
C.	Wrong	Heater power does not change since it is not related to hydrogen concentration.
D.	Wrong	Heater power does not change since heater power is not variable.

Explanation (Optional): The heater gas temperature (3HCS*TS4A1A) will decrease as the hydrogen concentration increases since the heat of reaction (3HCS*TIC5A1) increases with increased hydrogen in the reaction chamber.

Technical Reference(s): OP3313A HYDROGEN RECOMBINER Note prior to step 4.4.14 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04742 Describe the operation of the... Hydrogen Recombiner... (during) post accident operation (after startup) (As available)

Question Source: Modified Bank # 0069918 (Note changes or attach parent)
Question History: Seen in program prior to modification
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 84	84	84
K/A # 034.K4.02 Fuel Handling Equipment System	Tier #	2	2
Knowledge of the design features and / or interlocks	Group #	3	2
which provide for fuel movement	Importance Rating	2.5	3.3

Proposed Question:

What is the purpose of the upload limit interlock on the new fuel elevator?

A.	Wrong	Prevent dropping a new fuel assembly from excessive heights should the elevator cable fail.
B.	Correct	Prevent raising an irradiated fuel assembly so that the minimum required depth of water shielding is maintained.
C.	Wrong	Prevent raising the elevator guide rollers out of the water, since the rollers are water lubricated.
D.	Wrong	Prevent raising the elevator when either cable binding is taking place or an obstruction is in the cart's path.

Explanation (Optional): The upload limit interlock stops upward motion of the elevator when loaded with a fuel assembly. Handling equipment used to raise and lower spent fuel has a limited maximum lift height so that the minimum required depth of water shielding is maintained.

Technical Reference(s): FSAR 9.1.4.1 Fuel Handling System Design (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04541 Describe the operation of the following fuel handling systems components controls and interlocks:... New fuel elevator... (As available)

Question Source: Old exam bank # 1568

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 85	85	
K/A # 076.A3.02 Service Water System SWS	Tier #	2	
Ability to monitor automatic operation of	Group #	3	
emergency heat loads	Importance Rating	3.7	3.7

Proposed Question:

With the plant initially at 100% power, a safety injection occurs. While checking the ESF status panel at E-0, step 14, the following valves are all noted to be OPEN:

- Service water supply to TPCCW 3SWP*MOV71A
- Service water supply to RPCCW 3SWP*MOV50A
- Service water return from the "A" EDG 3SWP*AOV39A

What action if any should the crew take regarding these three valves?

Answers

A.	Correct	Leave all of the valves in their current positions.
B.	Wrong	CLOSE service water supply to TPCCW 3SWP*MOV71A
C.	Wrong	CLOSE service water supply to RPCCW 3SWP*MOV50A
D.	Wrong	CLOSE service water return from the EDGs 3SWP*AOV39A

Explanation (Optional): SWP*MOV71 is normally open and shuts on CDA, LOP and SWP low pressure. MOV50A is normally open and closes on a CDA. AOV39A is normally closed and opens on CDA/LOP or SIS. Therefore all three valves should be open after SIS.

Technical Reference(s): P&ID 133 Series (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05718Describe the operation of the Service Water System under the following normal, abnormal, and emergency conditions:... Safety Injection... (As available)

Question Source: Modified bank # 0064332

Question History: Seen on previous exam prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 86	86	86
K/A # Site Specific Topic: SBO Diesel	Tier #	2	2
	Group #	3	3
	Importance Rating	NA	NA

Proposed Question:

A station blackout is in progress and the only source of power is the SBO diesel, supplying the "B" Train electrical busses.

Which of the following SBO diesel trip conditions is bypassed during this emergency operation?

Answers

A.	Wrong	Primary lockout relay tripped.
B.	Correct	High water temperature.
C.	Wrong	Low lube oil pressure.
D.	Wrong	Engine overspeed.

Explanation (Optional):

Conditions that will cause the SBO output breaker to auto trip include:
1. SBO primary lockout (86P) tripped - immediate engine shutdown ("A" wrong).
2. SBO backup lockout (86B) tripped (bypassed in "EMERG")
3. SBO under-frequency (81T)
4. High water temperature - normal engine shutdown (bypassed in "EMERG") ("B" correct)
5. High lube oil temperature - normal engine shutdown (bypassed in "EMERG")
6. High Crankcase pressure - immediate engine shutdown (bypassed in "EMERG")
7. Low oil pressure - immediate engine shutdown ("C" wrong)
8. Low cooling level and pressure - immediate engine shutdown
9. Engine overspeed - immediate engine shutdown ("D" wrong)
10. Emergency stop PBs (both) at either local control panel or at the engine terminal box in the engine room

Technical Reference(s): OP 3353.SBO (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05623 Describe the operation of the SBO system under the following normal, abnormal, and emergency conditions:... Station Blackout (at power) (As available)

Question Source: Modified Bank # 0064207

Question History: Seen in program prior to modification

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: Plant specific priority

Comments: SBO diesel required by Millstone 3 to meet SBO coping time.

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 87	87	87
K/A # 103.A2.03 Containment System	Tier #	2	2
Ability to predict the impact of a phase A and B isolation,	Group #	3	2
and use procedures to mitigate the consequences.	Importance Rating	3.5*	3.8*

Proposed Question:

Which of the following describes why RCPs are tripped during E-0 REACTOR TRIP OR SAFETY INJECTION step 11 "Check if CDA Required", if a CDA has actuated?

Answers

A.	Wrong	Prevents excessive RCS inventory loss.
B.	Wrong	Minimizes the energy released to containment.
C.	Correct	Protects the RCPs due to a loss of cooling.
D.	Wrong	Minimizes heat input into the RCS.

Explanation (Optional): Component cooling water is isolated to the RCPs on the CIB signal. RCPs are tripped to prevent overheating.

Technical Reference(s): WOG BKGD Doc for E-0 step 14 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04337 DISCUSS THE BASIS OF MAJOR PROCEDURE STEPS AND/OR SEQUENCE OF STEPS IN EOP 35 E-0. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5
55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 88	88	88
K/A # GEN.2.1.23 Conduct of Operations	Tier #	3	3
Ability to perform specific and integrated plant	Group #	1	1
procedures during all modes of plant operation	Importance Rating	3.9	4.0

Proposed Question:

The crew is preparing to perform a surveillance using a "General Level of Use" procedure.

Which of the following describes the procedure performance requirements for this procedure?

A.	Wrong	Read each step prior to performing that step.
B.	Wrong	Verify that each step was performed correctly prior to commencing the next step.
C.	Correct	Keep the procedure at the job site and available at all times.
D.	Wrong	Reference the procedure before or during the activity only if deemed necessary.

Explanation (Optional): Continuous Level of Use requires that you keep the procedure at the job site and available at all times, read each step prior to performing that step, and verify that each step was performed correctly prior to commencing the next step. General Level of Use requires that you keep the procedure at the job site and available at all times ("C" correct), and allows you to read as many steps as can be easily remembered prior to performing the steps, and verification can be performed after completion of the group of steps ("A" and "B" wrong). Information Level of Use only requires that you reference the procedure before or during the activity if deemed necessary ("D" wrong).

Technical Reference(s): DC4 PROCEDURAL COMPLIANCE, Section 1.5 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: NAD841 Differentiate between "Continuous Level of Use", General "Level of Use" and Information "Level of Use" procedures (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.45.2 and 45.6

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 89	89	89
K/A # GEN.2.1.30	Tier #	3	3
Ability to locate and operate components, including local controls	Group #	1	1
	Importance Rating	3.9	3.4

Proposed Question:

A PEO is sent out to perform an independent verification of a valve lineup. During the verification, the PEO finds a valve closed that is required to be open.

Which one of the following actions is required?

A.	Wrong	Do not reposition the valve, document the wrong position on the valve lineup sheet, and continue with the verification.
B.	Wrong	Reposition the valve, initial the appropriate box on the valve lineup sheet, and continue with the verification.
C.	Correct	Do not reposition the valve, and immediately notify the Shift Manager or Unit Supervisor of the discrepancy.
D.	Wrong	Reposition the valve, and then notify the Shift Manager or Unit Supervisor of the discrepancy.

Explanation (Optional): If a discrepancy is discovered, the PEO should immediately notify the SM/US. The independent verifier is not authorized to realign the system.

Technical Reference(s): WC-6 Determination and Performance of Independent and Dual Verifications, step 1.3.8 and NOTE. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: NAD527 Discuss the methods of performing independent verifications (As available)

Question Source: 1995 Millstone 3 NRC Exam

Question History: Previous NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 90	90	
K/A # GEN.2.2.2 Equipment Control	Tier #	3	
Ability to operate the console controls as required to operate	Group #	2	
the facility between shutdown and designated power levels	Importance Rating	4.0	3.5

Proposed Question:

INITIAL CONDITIONS:

- The plant is in MODE 5.
- The pressurizer is solid.

What action would the RO take to lower RCS pressure?

A.	Wrong	Place an additional letdown orifice in service.
B.	Wrong	Throttle open auxiliary spray valve 3CHS*AV8145.
C.	Wrong	Throttle open RHR to letdown flow control valve 3CHS*HCV128.
D.	Correct	Throttle open letdown pressure control valve 3CHS*PCV131.

Explanation (Optional): "A" is wrong since all orifices were placed in service during the plant cooldown. "B" is wrong since spray does not affect pressure when solid. "D" is correct, and "C" is wrong since OP 32081 has the operator use 3CHS*PCV131 to control pressure.

Technical Reference(s): OP3208 Plant Cooldown (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04202 Describe the operation of the below listed Systems under various operating conditions: A. Normal Operations... Chemical and Volume Control System... (As available)

Question Source: Modified Bank # 0068581

Question History: Not seen in program

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.45.2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 91	91	91
K/A # GEN.2.2.11 Equipment Control	Tier #	3	3
Knowledge of the process for controlling	Group #	2	2
temporary changes	Importance Rating	2.5	3.4

Proposed Question:

Which one of the following temporary installations in the plant would require a temporary modification tag to be installed on it per WC10 TEMPORARY MODIFICATIONS?

A.	Correct	A leaking relief valve on the "A" auxiliary boiler has been gagged shut.
B.	Wrong	A hose has been connected from a service air connection to a temporary sump pump in the main condenser pit.
C.	Wrong	Plastic sheeting has been installed over a Water Treating system pump to protect it from rain water.
D.	Wrong	A drain hose has been connected from a Service Water pipe to a floor drain.

Explanation (Optional): Plastic sheeting ("C" wrong) and connections to service connections ("B" and "D" wrong) are not temporary modifications.

Technical Reference(s): WC10 Temporary Modifications sec. 1.1.4 and Att. 1. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05104 Outline the process for jumper or lifted lead installation. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.10
55.43.3

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 92	92	
K/A # GEN.2.2.22 Equipment Control	Tier #	3	
Knowledge of limiting conditions for operation	Group #	2	
and safety limits	Importance Rating	3.4	4.1

Proposed Question:

The definition for a LIMITING CONDITION FOR OPERATION is that part of a Technical Specification which:

Answers

A.	Wrong	prescribes remedial measures required under designated conditions.
B.	Wrong	specifies surveillance requirements to determine component operability.
C.	Correct	establishes lowest functional capability or performance levels of equipment required for safe operation.
D.	Wrong	describes the status of the plant, i.e., core reactivity, power level, and average coolant temperature.

Explanation (Optional): "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specification until the condition can be met." ("C" correct)

Technical Reference(s): Tech Spec definition section. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05786 State the definition of a LIMITING CONDITION FOR OPERATION (LCO) (As available)

Question Source: Bank # 0068710

Question History: Previous Quiz / Test

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 93	93	93
K/A # GEN.2.2.23 Equipment control	Tier #	3	3
Ability to track limiting conditions for operation	Group #	2	2
	Importance Rating	2.6	3.8

Proposed Question:

The US informs the RO that Safety Injection pump 3SIH*P1A failed its surveillance and the associated ACTION STATEMENT must be entered.

What process is required to track the status of the ACTION STATEMENT?

A.	Wrong	The RO will generate a CR that will be reviewed and approved by the SM.
B.	Wrong	The RO will notify the work control SRO of the ACTION STATEMENT.
C.	Wrong	The RO will notify the system engineer, who will generate an Allowed Outage Time form.
D.	Correct	The RO will enter the ACTION STATEMENT into the shift log.

Explanation (Optional): Entry into an ACTION STATEMENT is a required entry to be entered into the shift log.

Technical Reference(s): OP3260 Conduct of Operations, Required Shift Entries (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-06593 Discuss the general requirements that apply to all formal logs. MC-06565 Briefly describe the responsibilities associated with the operating crews. (As available)

Question Source: New
Question History: None
Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.43.2
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 94	94	94
K/A # GEN.2.3.1 Radiation Control	Tier #	3	3
Knowledge of 10CFR20 and related facility	Group #	3	3
radiation limits.	Importance Rating	2.6	3.0

Proposed Question:

A PEO has the following dose history:

- Total lifetime exposure: 1,100 mrem TEDE
- Current year's exposure: 50 mrem TEDE
- No authorizations have been given for extending his administrative dose limit.

While performing a valve lineup in the Auxiliary Building pipe chase area, the PEO is not informed of a demin resin slurry transfer taking place. The PEO receives a dose of 2,500 mrem.

Which of the following is true concerning the PEO's annual dose limits?

A.	Wrong	The dose is within both the annual NU admin limit and the federal limit.
B.	Correct	The dose exceeds the annual NU admin limit but is within the federal limit.
C.	Wrong	The dose is within the annual NU admin limit but exceeds the federal limit.
D.	Wrong	The dose exceeds both the annual NU admin limit and the federal limit.

Explanation (Optional): The PEO's annual dose is now 2550 mrem, which is above the administrative dose limit of 1,000mr, but within the federal limit of 5,000 mrem per year.

Technical Reference(s): Radiation Protection Manual (Attach if not previously provided)
10CFR20

Proposed references to be provided to applicants during examination: None

Learning Objective: RAD State the federal radiation limits for TEDE. (As available)
RAD State the plant administrative guidelines for radiation dose.

Question Source: New
Question History: None
Question Cognitive Level: Comprehension or Analysis
10 CFR Part 55 Content: 55.41.12 / 43.4
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 95	95	95
K/A # GEN.2.3.4 Radiation Control	Tier #	3	3
Knowledge of radiation exposure limits and contamination control,	Group #	3	3
including permissible levels in excess of those authorized	Importance Rating	2.5	3.1

Proposed Question:

A Site Area Emergency has been declared due to a LOCA outside CTMT. The LOCA is into the ESF building, a pathway to the environment exists, and limited makeup to the RWST is available. An operator is sent in to the ESF building to locally isolate the leak. This action has all of the required approvals, and would result in a significant reduction in offsite dose.

The operator has a total lifetime exposure of 4200 mrem TEDE and an exposure for the current year of 200 mrem.

What is the maximum exposure the operator may receive while performing this action?

A.	Wrong	800 mrem TEDE
B.	Wrong	4800 mrem TEDE
C.	Wrong	23800 mrem TEDE
D.	Correct	25000 mrem TEDE

Explanation (Optional): Emergency exposure limits for lifesaving or protection of large populations is 25 rem.

Technical Reference(s): EPIP (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____

Learning Objective: EP-0216 Explain the requirements for exposure control during a nuclear incident (As available)

Question Source: New

Question History: Braidwood NRC Exam

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.4

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 96	96	96
K/A # GEN.2.4.5 Emergency Procedures / Plan	Tier #	3	3
Knowledge of the organization of the operating procedures	Group #	4	4
network for normal, abnormal, and emergency evolutions	Importance Rating	2.9	3.6

Proposed Question:

During an emergency condition after exiting E-0 the RO reports the following conditions:

- Containment - ORANGE path
- Core cooling - RED path
- Heat sink - RED path
- Integrity - ORANGE path

Select the order in which the above conditions should be addressed.

Answers

A.	Wrong	Core Cooling, Heat Sink, Containment, Integrity.
B.	Correct	Core Cooling, Heat Sink, Integrity, Containment.
C.	Wrong	Heat Sink, Core Cooling, Containment, Integrity.
D.	Wrong	Heat Sink, Core Cooling, Integrity, Containment.

Explanation (Optional): Red path is higher priority than orange path. Core Cooling is higher priority than Integrity ("C" and "D" wrong). Heat Sink is higher priority than Containment ("A" and "C" wrong).

Technical Reference(s): OP 3272 EOP User's Guide (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04453 Given a specific plant condition, describe the use of the critical safety function (CSF) status tree rules of priority toward implementation of the functional response procedures including the person(s) responsible for monitoring the CSF status trees and priority of implementation. (As available)

Question Source: Modified Bank # 0070166 (Note changes or attach parent)

Question History: Seen in program prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.10
55.43.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 97	97	97
K/A # GEN.2.4.6 Emergency Procedures / Plan	Tier #	3	3
Knowledge of symptom based EOP mitigation strategies	Group #	4	4
	Importance Rating	3.1	4.0

Proposed Question:

A small break LOCA has occurred and no high head injection pumps are running. CETCs are at 1220°F and the operating shift is responding in accordance with the appropriate response procedure.

Which of the following lists the recovery strategies in the correct sequence for the condition?

Answers

A.	Wrong	Start ECCS, depressurize RCS, depressurize secondary, start RCPs.
B.	Correct	Start ECCS, depressurize secondary, start RCPs, depressurize RCS.
C.	Wrong	Depressurize secondary, start ECCS, depressurize RCS, start RCPs.
D.	Wrong	Depressurize secondary, depressurize RCS, start RCPs, start ECCS.

Explanation (Optional): FR-C.1 step 2: Verify ECCS flow, step 10 depressurizes all intact SGs to 140 psig, step 17 starts RCPs. Step 17 RNO Opens PZR PORVs if RCPs are running.

Technical Reference(s): FR-C.1 steps 2, 10, 17, 17 RNO (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04934 PRIORITIZE the Operator-initiated recovery techniques that would mitigate the consequences of a Loss of Core Cooling. (As available)

Question Source: Modified Bank # 0065036 (Note changes or attach parent)
Question History: Seen in program prior to modification
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.10 / 43.5 / 45.13
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 98	98	
K/A # GEN.2.4.24 Emergency Procedures / Plan	Tier #	3	
Knowledge of loss of cooling water procedures	Group #	4	
	Importance Rating	3.3	3.7

Proposed Question:

The crew has entered AOP 3561 LOSS OF REACTOR PLANT COMPONENT COOLING WATER. The "B" RPCCW pump has tripped, and the "C" pump can not be started.

Why does the AOP direct the crew to isolate auxiliary steam to the auxiliary building in this situation?

A.	Wrong	Minimizes the potential for a degassifyer trip.
B.	Wrong	Minimizes the potential for a boron evaporator trip.
C.	Wrong	Minimizes the potential for an auxiliary boiler trip.
D.	Correct	Minimizes the potential for an uncontrolled radiation release.

Explanation (Optional): If the "B" train of RPCCW is lost, cooling is lost to the degassifyer condenser and the boron evaporator condenser, with consequential pressure increase and relief valve opening. These relief valves vent to the turbine building stack. Isolating aux steam to the auxiliary building is the quickest means of controlling this problem.

Technical Reference(s): AOP 3561 Loss of RPCCW basis document (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03934 Discuss the basis of major precautions, procedure steps and/or sequence of steps. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.10
55.45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record #	99	99
K/A # GEN.2.4.35 Emergency Procedures / Plan	Tier #	3	3
Knowledge of local auxiliary operator tasks during emergency operations including system geography and implications	Group #	4	4
	Importance Rating	3.3	3.5

Proposed Question:

A loss of all service water has occurred, and the crew has entered AOP 3560 LOSS OF SERVICE WATER. No service water pumps can be started, and the crew isolates letdown and trips the reactor.

Which local PEO action is also required by the AOP under these conditions?

A.	Wrong	Trip all RCPs from the 6.9KV switchgear.
B.	Wrong	Start all traveling water screens in fast speed at the intake structure.
C.	Wrong	Isolate seal injection at the Auxiliary Building 4 foot level.
D.	Correct	Establish feed and bleed to the charging pump cooling system.

Explanation (Optional): AOP 3560 directs using Attachments "A" and "B" as guidance if a transition to E-0 is made. Attachment "A" has RCP trip criteria and Attachment "B" is the feed and bleed procedure. "A" is wrong since RCPs are tripped from the control room. "C" is wrong since the crew has isolated letdown, so the VCT is not heating up. "D" is correct since service water cools the charging pump cooling water heat exchangers.

Technical Reference(s): AOP 3560 Step 2 Note and Attachments "A" and "B" (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03928 Discuss the basis of major precautions, procedure steps and/or step sequence. (As available)

Question Source: Bank # 0063926

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.43.5
55.45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 100	100	
K/A # GEN.2.4.50 Emergency Procedures / Plan	Tier #	3	
Ability to verify system alarm setpoints and operate	Group #	4	
controls identified in the alarm response manual	Importance Rating	3.3	3.3

Proposed Question:

With the plant at 100% power, a GEN CORE MONITOR LEVEL HI annunciator comes in on Main Board 7. The dispatched PEO reports back that the local trace had dropped fairly rapidly from 90% to 5%. The US directs the PEO to depress the "FILTER" pushbutton and report the results. The PEO reports that the trace returned to 90% with the FILTER pushbutton depressed.

What action should the crew take?

A.	Wrong	Trip the reactor and go to E-0 REACTOR TRIP OR SAFETY INJECTION, since generator hydrogen purity is low.
B.	Correct	Trip the reactor and go to E-0 REACTOR TRIP OR SAFETY INJECTION, since generator overheating is occurring.
C.	Wrong	Submit a Trouble Report, since indication of core monitor filter clogging exists.
D.	Wrong	Submit a Trouble Report, since indication of core monitor instrument degradation exists.

Explanation (Optional): Main Generator overheating results in organic material being released into the cooling gas stream, which results in a decreasing indication on the core monitor ("B" correct, "A" wrong) Instrument degradation is characterized by a slow decline in the instrument trace, and the trace will not recover when the filter is placed in service ("C" and "D" are wrong).

Technical Reference(s): OP 3353.MB7C 4-5 Gen Core Monitor Level Hi (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04703 Given a plant condition or equipment malfunction relating to the GMO system, determine when the turbine is required to be tripped, or when the generator must be shutdown. (As available)

Question Source: New

Question History: None

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.45.3

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 101		7
K/A # W/E08.EK1.3 Pressurized Thermal Shock	Tier #		1
Knowledge of operational implications of	Group #		1
conditions and remedial actions.	Importance Rating		4.0

Proposed Question:
While responding to a pressurized thermal shock (PTS) condition in accordance with FR-P.1, the operator is directed to check if ECCS can be terminated.

Which of the following describes the two reasons for terminating ECCS when responding to a PTS condition?

A.	Wrong	SI flow may have contributed to the RCS cooldown, and may cause excessive cycling of the pressurizer PORVs.
B.	Wrong	SI flow may have contributed to thermal stresses in the reactor vessel Thot and Tcold nozzles, and may cause excessive cycling of the pressurizer PORVs.
C.	Correct	SI flow may have contributed to the RCS cooldown, and may prevent a subsequent RCS pressure reduction.
D.	Wrong	SI flow may have contributed to thermal stresses in the reactor vessel Thot and Tcold nozzles, and may prevent a subsequent RCS pressure reduction.

Explanation (Optional): SI flow may have contributed to the RCS cooldown, and may prevent a subsequent RCS pressure reduction ("C" correct). Excessive PORV cycling is not the major concern ("A" and "B" wrong), and the vessel downcomer is the area of greatest concern during a PTS event ("B" and "D" wrong).

Technical Reference(s): WOG Background Doc for FR-P.1 (Attach if not previously provided)
Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04553 DISCUSS THE BASIS OF MAJOR PROCEDURE STEPS AND/OR SEQUENCE OF STEPS IN EOP 35 FR-P.1. (As available)

Question Source: Bank # 0065033
Question History: Not seen in program
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.8, 41.8 / 45.3
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 102		29
K/A # APE.005.A2.03 Inoperable / Stuck Control Rod	Tier #		1
Ability to determine required actions if more than one	Group #		1
rod is stuck or inoperable	Importance Rating		4.4

Proposed Question:

Initial Conditions:

- The unit is at 80% power
- Two control rods in Group 1 of Control Bank 'D' are found misaligned from their group step counters by 13 steps below the rest of the group.
- The two misaligned rods were determined to be trippable but otherwise immovable
- Subsequently, the crew determines that Control Bank 'D' rods cannot be manually moved.

When must the plant be in HOT STANDBY?

Answers

A.	Wrong	Immediately (Reactor trip is required).
B.	Correct	6 hours.
C.	Wrong	7 hours.
D.	Wrong	72 hours.

Explanation (Optional): T.S. 3.1.3.1 requires + 12 step alignment. ACTION c.1. requires that within 1 hour the remainder of the rods in the bank(s) with the inoperable rods are aligned to within + 12 steps of the inoperable rods. Since bank D is inoperable T.S. 3.1.3.1 ACTION D applies - be in HOT STANDBY in 6 hours.

'A' is wrong since reactor trip is required if 2 or more rod drop.

'C' is wrong since the six hours starts as soon as Bank D rods were discovered out of alignment (ACTION d). The one hour repair time would be available if Tech Spec 3.03 had been entered.

'D' is wrong since 72 hours to restore to operable applies only if rods are within + 12 steps (ACTION D).

Technical Reference(s): Tech Spec 3.1.3.1 ACTIONS c and d (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Tech Spec sections 3 and 4

Learning Objective: MC-03904 Given a plant condition requiring the use of AOP 3552, identify applicable technical specification action requriements. (As available)

Question Source: Modified Bank # 0065076

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 104		34
K/A # EPE.029.EK1.01 ATWS	Tier #		1
Reactor nucleonics and thermohydraulic behavior	Group #		1
	Importance Rating		3.1

Proposed Question:

The ATWS analyses for a Loss of Turbine Load event and a Loss of Feedwater event both predict the RCS temperature decrease causes recriticality to occur and that without operator action reactor power eventually stabilizes at approximately 5%.

Which of the following is responsible for power leveling off at 5%?

Answers

A.	Wrong	Doppler Power Coefficient.
B.	Correct	AFW system capacity.
C.	Wrong	Moderator Temperature Coefficient.
D.	Wrong	Steam demand of two atmospheric dump valves.

Explanation (Optional): Upon loss of feedwater, RCS heats up due to heat imbalance, shutting the reactor down. AFW is assumed to be supplied to the SGs, so the RCS starts to cool down. The reactor goes recritical, and will stabilize when heat production equals heat removal, which is limited by AFW flow to about 5% power.

Technical Reference(s): WOG background FR-S.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04945 Assuming no Operator-initiated recovery technique, ANALYZE the ATWS Event leading to Core Damage. (As available)

Question Source: Bank # 0070061

Question History: Previous Test

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.8, 41.10 / 45.3

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 105		36
K/A # APE.059.AK1.05 Accidental Liquid Rad Release	Tier #		1
Operational implications of calculations for offsite	Group #		1
dose release due to accidental liquid release	Importance Rating		3.6*

Proposed Question:

With the Radioactive Liquid Waste radiation monitor 3LWS-RE70 out of service, the following sequence of events occurs:

1. A discharge of the "A" Low Level Waste Drain Tank (LLWDT) is commenced.
2. A PEO accidentally commences transfer of the "A" High Level Waste Drain Tank to the discharging LLWDT.
3. The error is detected and the discharge terminated after a significant amount of highly radioactive water has been discharged.
4. An "Unusual Event, Delta-Two" is declared due to the unplanned release continuing greater than 60 minutes.
5. Rad assessment determines that the integrated dose offsite is 0.01 Rem TEDE and 0.3 Rem CDE thyroid.

What is the new classification ~~now that the rad assessment is complete?~~ if any on this event

Answers

A.	Wrong	General Emergency, Alpha
B.	Correct	Site Area Emergency, Charlie-Two
C.	Wrong	Alert, Charlie-One
D.	Wrong	Unusual Event, Delta-Two

Explanation (Optional): Site Area Emergency, Charlie-Two is declared based on rad assessment $\geq$ 0.25 CDE thyroid ("B" Correct, "C" and "D" wrong). To reach General Emergency, Alpha,, $\geq$ 5 Rem CDE thyroid must be reached. The TEDE value listed in the stem is at the Alert, Charlie-One level, but the higher classification prevails.

Technical Reference(s): Millstone 3 EAL Tables Offsite Release Column OS1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: EAL Table

Learning Objective: MC-04381 Explain the proper use of the EAL tables to determine the EAL classification for the existing plant conditions. (As available)

Question Source: New

Question History: Not seen in program

Question Cognitive Level: Comprehension or Analysis

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 106		37
K/A # 069.GEN.2.4.21 Loss of CTMT Integrity	Tier #		1
Knowledge of perameters and logic used to assess the	Group #		1
status of safety functions, including: CTMT conditions	Importance Rating		4.3

Proposed Question:

The following sequence of events occurs:

1. A LOCA has occurred.
2. The crew is performing actions in E-1 LOSS OF REACTOR OR SECONDARY COOLANT.
3. The RO reports that the "Containment" status tree has turned from GREEN to ORANGE.
4. The STA informs the crew that no other RED or ORANGE paths exist.
5. Containment pressure is 19 psia and slowly increasing.
6. Containment radiation is 100 R/hr and slowly increasing.
7. Containment sump level is 16 feet and slowly increasing.

What action, if any, should be taken by the crew to address the ORANGE path?

Answers

A.	Wrong	No action is required, since the crew has verified that the status tree is invalid.
B.	Wrong	Transition to FR-Z.1 "Response to High Containment Pressure".
C.	Correct	Transition to FR-Z.2 "Response to Containment Flooding".
D.	Wrong	Transition to FR-Z.3 "Response to High Containment Radiation Level".

Explanation (Optional): CTMT orange paths are from CTMT pressure of 23 psia ("B" wrong), or CTMT high sump level 15.75 feet ("D" correct, "A" and "C" wrong). CTMT radiation is a yellow path.

Technical Reference(s): CTMT CSF Status Tree (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05991 Identify plant conditions that require entry into EOP 35 FR-Z.2 (As available)

Question Source: Modified Bank # 0071298

Question History: Not seen in program

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.5 / 45.12

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 107		39
K/A # 074.EK1.2 Inadequate Core Cooling	Tier #		1
Knowledge of the operational implications of the	Group #		1
potential consequences of uncovering the core	Importance Rating		4.8

Proposed Question:

The following sequence of events occurs:

1. A small cold leg break loss of coolant accident occurs
2. Safety injection actuates
3. The pressurizer empties
4. RCS pressure decreases to approximately 1200 psia within 2 minutes, and stabilizes.
5. Subcooling based on core exit thermocouples is 0°F
6. SG pressure is being maintained by the atmospheric dump valves

Which of the following describes why pressure has stabilized in the RCS?

Answers

A.	Wrong	Mass injected into the RCS from the accumulators equals the mass loss from the LOCA.
B.	Wrong	Mass injected into the RCS from the Charging and SIH pumps equals the mass loss from the LOCA.
C.	Wrong	Energy removal from the RCS via the steam generators has stopped and energy removal is provided solely by the break flow from the RCS.
D.	Correct	RCS inventory is decreasing, but insufficient heat removal out the break results in Steam Generators removing the excess heat.

Explanation (Optional):

The vessel acts as a pressurizer, with decay heat acting like PZR heaters. Decay heat exceeds break heat removal. RCS pressure stabilizes at a pressure slightly elevated above the steam generator pressure, with excess heat removal through the steam generator steam dumps. Even with equilibrium RCS pressure, break flow remains in excess of ECCS flow, continuing inventor loss. Fuel will uncover.

A is incorrect, RCS pressure is above accumulator pressure.
B incorrect, since pressure rapidly dropped to 1200 psia and CETCs indicate RCS saturation. For small breaks where mass in is balanced with mass out, the pressurizer empties much more slowly.
C incorrect, RCS pressure is slightly above SG pressure.

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 108		41
K/A # APE.033.AA2.10 Loss of Intermediate Range NIS	Tier #		1
Ability to determine and interpret Tech Spec limits if both	Group #		2
intermediate range channels have failed	Importance Rating		3.8

Proposed Question:

The crew is starting up the plant after a refueling outage. It is discovered that, due to an improperly installed Nuclear Instrumentation modification, neither NIS intermediate range channel is working.

What ACTION is required by Technical Specifications?

Answers

A.	Wrong	If power is at 100 counts in the source range, restore both IRNIs to OPERABLE prior to exceeding the P-6 setpoint.
B.	Wrong	If power is 10-8 amps in the intermediate range, restore both IRNIs to OPERABLE prior to exceeding 10% power.
C.	Wrong	If power is at 1%, power operation may continue as long as both channels are placed in the tripped condition within 6 hours.
D.	Correct	If power is at 8%, within one hour initiate action to be in at least HOT STANDBY within the next six hours.

Explanation (Optional): Per Tech Spec 3.3.1, minimum channels is 2. ACTION does not address 2 channels less than minimum, so entry into 3.0.3 is required ("D" correct). "A" and "B" are wrong, since these are required per ACTION 3 if only one channel is inoperable. "C" is wrong, since this ACTION relates to a loss of a power range channel.

Technical Reference(s): Tech Specs 3.0.3 and 3.3.1. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Tech Spec sections 3 and 4.

Learning Objective: MC-03979 Given a plant condition requiring the use of AOP-3571, identify applicable technical specification action requirements. (As available)

Question Source: Modified Bank # 0069053

Question History: Seen in program prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.5 / 45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 109		43
K/A # EPE.038.K3.06 Steam Generator Tube Rupture	Tier #		1
Knowledge of the reasons for the actions contained	Group #		2
in the EOP	Importance Rating		4.5

Proposed Question:

The crew is performing E-3, "Steam Generator Tube Rupture", and is preparing to initiate the RCS cooldown. E-3 directs the crew to check if ruptured SG pressure is greater than 420 psig; otherwise they are to transition to ECA-3.1, "SGTR with Loss of Reactor Coolant-Subcooled Recovery Desired".

Which of the following describes a reason for ensuring the ruptured steam generator pressure is greater than 420 psig?

Answers

A. Correct To ensure subsequent RCS cooldown does not cause a PTS concern.

B. Wrong To ensure the ruptured steam generator pressure is greater than the intact steam generator pressures.

C. Wrong To ensure that a low steam line pressure safety injection does not occur.

D. Wrong To ensure that RCS subcooling is maintained upon the subsequent RCS cooldown.

Explanation (Optional): Although it is important that ruptured SG is isolated from intact SGs with pressure > Intact SG pressure, this verification is made in previous steps of E-3, and appropriate action taken if these conditions do not exist ("B" and "D" are wrong). The RCS cooldown that would be required to obtain the necessary subcooling during the upcoming RCS depressurization to less than ruptured SG pressure would present a PTS concern in the RCS ("A" is correct). "C" is wrong because automatic SI actuation at this point in the recovery would have been defeated since SI is reset in step 8 of E-3.

Technical Reference(s): EOP 35 E-3, Step 13 Basis, WOG Bkgd Doc (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04372 Discuss the basis of major procedure steps and/or sequence of steps in EOP 35 E-3. (As available)

Question Source: Bank # 0060627

Question History: Previous Test, and 95 NRC Exam

Question Cognitive Level: Memory or fundamental knowledge

10 CFR Part 55 Content: 55.41.5, 41.10 / 45.6, 45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 110		44
K/A # 058.A2.03 Loss of DC Bus Power	Tier #		1
Ability to determine and interpret DC loads lost;	Group #		2
impact on ability to operate and monitor plant systems	Importance Rating		3.9

Proposed Question:

Plant Conditions

- The plant was in mode 1, 100% power, when a loss of DC bus 1 occurs.
- The plant is tripped, the Control Room team is carrying out the actions of ES-0.1, "Reactor Trip Response" and AOP-3563, "Loss of DC Bus Power".
- RCS temperature is 561°F.

What method is available to the operators in the control room for reducing RCS temperature?

Answers

A.	Wrong	All 9 Condenser Steam Dumps.
B.	Wrong	All 4 Atmospheric Dump Valves.
C.	Correct	All 4 Atmospheric Dump Bypass Valves.
D.	Wrong	All Steam Generator Safety Valves.

Explanation (Optional): Condenser Steam Dump Valves are not available since the MSIVs have failed closed ("A" wrong). Two atmospheric dump valves have failed closed, but all atmospheric dump bypass valves are available ("B" wrong, "C" correct). The safety valve setpoints can not be adjusted in the control room, so they cannot be used to lower temperature ("D" wrong).

Technical Reference(s): AOP 3563 Att. A. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03309 Given a failure of the 125 VDC distribution system or a portion of the system, determine the effects on the system and on interrelated systems... loss of dc bus effect on control systems (As available)

Question Source: Modified Bank # 0070404

Question History: Seen in program prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.5 / 45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 111		45
K/A # W/E16.EA2.2 High Ctmt Radiation	Tier #		1
Adherence to appropriate procedures and	Group #		2
operation within limits	Importance Rating		3.3

Proposed Question:

The reactor has tripped, and the crew is progressing through the EOP network. The crew enters EOP 35 FR-Z.3 RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL.

Which Ctmt ventilation system will FR-Z.3 have the ADTS consider using?

Answers

A.	Correct	Ctmt Air Filtration System.
B.	Wrong	Ctmt Air Recirculation System.
C.	Wrong	Ctmt Purge System.
D.	Wrong	Ctmt Vacuum System.

Explanation (Optional): FR-Z.3 consists of one step plus a transition step. The one step samples Ctmt atmosphere, considers the use of Ctmt Air Filtration ("A" correct), and considers use of Ctmt Spray System.

Technical Reference(s): EOP 35 FR-Z.3 Response to High Ctmt Radiation Level (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05972 Describe the major action categories within EOP 35 FR-Z.3. (As available)

Question Source: New
Question History: Not seen in program
Question Cognitive Level: Memory of Fundamental Knowledge

10 CFR Part 55 Content: 55.43.5 / 45.13
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 112		47
K/A # 036.AA1.04 Fuel Handling Incidents	Tier #		1
Ability to operate and / or monitor fuel handling	Group #		3
equipment	Importance Rating		3.7

Proposed Question:

The SIGMA refueling machine operator believes he is ready to release a fuel assembly into the core, and the Refueling SRO has given permission to release the fuel assembly.

What two conditions need to be verified prior to releasing the fuel assembly?

Answers

A.	Correct	"Full Down" must be displayed on the Sigma CRT and the "Jog" light must be off.
B.	Wrong	"Full Down" must be displayed on the Sigma CRT and the "Jog" light must be on.
C.	Wrong	"Full Down" must NOT be displayed on the Sigma CRT and the "Jog" light must be off.
D.	Wrong	"Full Down" must NOT be displayed on the Sigma CRT and the "Jog" light must be on.

Explanation (Optional): The SIGMA refueling machine operator shall not release a fuel assembly in the core until the following conditions have been met: "FULL DOWN" displayed on CRT, JOG light is off, and permission from the fuel foreman or SRO.

Technical Reference(s): OP 3303E Sigma Refueling Machine, Precaution 3.7 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-04541 Describe the operation of the following fuel handling systems components controls and interlocks:... sigma refueling machine... (As available)

Question Source: Old Bank # 1812

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.7 / 45.5, 45.6

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 113		48
K/A # W/E13.EK3.2 Steam Generator Overpressure	Tier #		1
Knowledge of the reasons for procedures associated	Group #		3
with Steam Generator overpressure	Importance Rating		3.3

Proposed Question:

The following sequence of events occurs:

1. The reactor has tripped and the crew is progressing through the EOP network.
2. A YELLOW path comes in on the "Heat Sink" status tree.
3. The crew enters EOP 35 FR-H.2 RESPONSE TO STEAM GENERATOR OVERPRESSURE.
4. The crew is preparing to dump steam from the affected SG.
5. The US reads a CAUTION that does not allow releasing steam from a SG with narrow range level GREATER THAN 87% prior to an evaluation.

Why shouldn't the crew dump steam from the affected SG if level is GREATER THAN 87%?

Answers

A.	Wrong	Releasing steam may cause an uncontrolled radiation release, since it is likely that the SG is ruptured.
B.	Correct	Releasing steam may result in two phase flow and water hammer, potentially damaging pipes and valves.
C.	Wrong	Releasing steam will be ineffective in lowering SG pressure, since SG water is likely subcooled.
D.	Wrong	Releasing steam will cause a rapid pressure drop in the RCS, potentially resulting in a Safety Injection.

Explanation (Optional): 87% narrow range level is indicative of a full SG. Releasing steam may also release water, resulting in water hammer.

Technical Reference(s): WOG Bkgd Document for FR-H.2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05976 Discuss the basis of major procedure steps and/or sequence of steps in EOP FR-H.2. (As available)

Question Source: New

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5, 41.10 / 45.6, 45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 114		49
K/A # 001.A4.11 Control Rod Drive System	Tier #		2
Ability to determine shutdown margin	Group #		1
	Importance Rating		4.1

Proposed Question:

Which of the following describes how SDM would be affected if one misaligned control rod is determined to be untrippable while the unit is in MODE 1?

Answers

A.	Wrong	SDM is increased by the worth of a stuck rod.
B.	Correct	SDM is reduced by the worth of a stuck rod.
C.	Wrong	SDM is increased by the worth of a misaligned or dropped rod.
D.	Wrong	SDM is reduced by the worth of a misaligned or dropped rod.

Explanation (Optional): "B" is correct, since if one rod is untrippable, SDM determination reduces the calculated SDM by the worth of one stuck rod because it is assumed that another rod in addition to the stuck rod will also remain out when the rods are inserted.
"A" and "C" are wrong, since the reactor would be shutdown by a smaller amount on a reactor trip with a rod stuck out, so shutdown margin is reduced, not increased.
"C" and "D" are wrong since the rod has been determined to be untrippable, which has a greater impact on SDM than a misaligned or dropped rod.

Technical Reference(s): OP 3209B Shutdown Margin (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03473 Perform a s/d margin calculation with a stuck, dropped or misaligned rod in MODES 1 or 2. (As available)

Question Source: Modified Bank # 0065027

Question History: Seen in program prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.7 / 45.5 to 45.8

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 115		56
K/A # 013.GEN.2.1.12 Engineered Safety Features	Tier #		2
Actuation System	Group #		1
Ability to apply technical specifications for a system	Importance Rating		4.0

Proposed Question:

The Shift Manager is reviewing the shiftly and weekly control room rounds and observes the following recorded perameters:

- The "B" train control room pressurization air bank pressure is 2100 psia.
- The "A" SIH pump to hot leg injection valve 3SIH*MV8802A is closed with its power lockout switch in "off".
- Accumulator "D" pressure is 640 psia.
- RWST temperature is 45°F.

What ACTION would be in compliance with Technical Specification ACTION STATEMENTS?

Answers

A.	Correct	Restore the inoperable control room envelope bank to OPERABLE within 7 days, or initiate and maintain operation of an OPERABLE Control Room Emergency Filtration System in the recirculation mode.
B.	Wrong	Restore the accumulator to OPERABLE within 8 hours or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours.
C.	Wrong	Restore the inoperable ECCS subsystem to OPERABLE within 72 hours or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.
D.	Wrong	Restore the RWST to OPERABLE within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Explanation (Optional): "A" is correct, since minimum pressure is 2200 psig. ACTION is not required for the SIH valve, since it is in the proper position ("B" is wrong), or for the accumulator, since its pressure is above 636 psia ("C" is wrong), or for the RWST, since its temperature is between 40 and 50°F ("D" is wrong).

Technical Reference(s): Tech Specs 3/4.5.1, 3/4.5.2, 3/4.5.4, 3/4.7.8 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Tech Specs sections 3 and 4

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 116		59
K/A # 072.K3.02 Area Radiation Monitoring System	Tier #		2
Knowledge of the effect that a loss or malfunction of	Group #		1
the ARM system will have on fuel handling operations	Importance Rating		3.5

Proposed Question:

The plant is in MODE 6.

It is desired to commence core offload, but the alarm circuitry for one of the Fuel Pool area monitors has failed. I&C is investigating, and no other operator actions have been taken.

Which of the following describes the required ACTION, if any, to be taken in order to allow core offload to commence?

A. Wrong — No ACTION required, fuel movement may commence.

B. Wrong — Fuel movement can be conducted indefinitely if an appropriate portable monitor is provided.

C. Correct — Fuel movement can be conducted for 30 days if an appropriate portable monitor is provided.

D. Wrong — Core offload can NOT be conducted until the instrument is repaired.

Explanation (Optional): "A" is wrong since Tech Spec minimum channels required is 2, currently only 1.
"C" is wrong since ACTION required is to provide the backup of suspend fuel movement.
"B" and "D" are wrong and "C" correct. Fuel movement can occur if a portable backup monitor is provided, then the monitor must be returned to OPERABLE status in 30 days or suspend fuel movement.

Technical Reference(s): Tech Spec 3.3.3.1, ACTION 28 (Attach if not previously provided)
Proposed references to be provided to applicants during examination: Technical Specifications sections 3 and 4
Learning Objective: MC-05473 Given a plant condition or equipment malfunction, use provided reference material to:... Evaluate Technical Specification applicability and determine required actions (As available)
Question Source: Modified from previous NRC Exam (97)
Question History: Modified from previous NRC Exam (97)
Question Cognitive Level: Comprehension or Analysis
10 CFR Part 55 Content: 55.41.7
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 117		62
015.A1.01 Nuclear Instrumentation System	Tier #		2
Ability to predict and / or monitor changes in NIS calibration	Group #		1
by heat balance to prevent exceeding design limits	Importance Rating		3.8

Proposed Question:

Initial conditions:

- The current 4 minute average calorimetric output is 3410 MWth based on a steam flow calculation.
- An I&C Technician removes a steam pressure instrument from service while performing calibrations.

The I&C Technician was unaware that the instrument fed into the calorimetric, and the calorimetric auto-swapped to an NI based calculation. The auto-swap caused the next calorimetric 4 minute average to jump to 3445 MWth (101%)

In accordance with OP 3204 AT POWER OPERATIONS, which of the following actions is required?

Answers

A.	Wrong	Immediately reduce 4 minute average power to less than or equal to 3400 MWth.
B.	Wrong	Notify the NRC within 24 hours.
C.	Wrong	Submit a CR.
D.	Correct	Maintain the shiftly 8 hour average less than or equal to 3411 MWth.

Explanation (Optional): If the 4 minute average exceeds 100.5%, promptly reduce power to less than or equal to 3411 MWth ("A" wrong), notify reactor engineering, and maintain the shiftly 8 hour average less than or equal to 3411 MWth ("D" correct). "B" is wrong since this action is required only if power exceeds 102%, and "B" and "C" are wrong since these actions are not required if the increase is simply due to a shift in calculation to NIS input.

Technical Reference(s): OP 3204 At Power Operations, sect 4.3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03397 Discuss the major action categories contained within OP 3204 (As available)

Question Source: New

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.5 / 45.5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 118		72
K/A # 011.GEN.2.1.33 Pressurizer Pressure Control	Tier #		2
Ability to recognize indications for system operating	Group #		2
perameters which are entry conditions for Tech Specs	Importance Rating		4.0

Proposed Question:

With the plant at 100% power, the power supply breaker for the "C" Pressurizer control heater group 3RCS-H1C trips. The investigation reveals a faulty trip relay in the heater breaker.

Which of the following describes the ACTION, if any, required by the crew?

Answers

A.	Correct	No ACTION required, all LCOs are met.
B.	Wrong	Restore the inoperable heaters to OPERABLE within 72 hours or be in at least HOT STANDBY within the next 6 hours..
C.	Wrong	Be in HOT STANDBY with the trip breakers open within 8 hours.
D.	Wrong	Restore the inoperable heaters to OPERABLE within 2 hours or be in at least HOT STANDBY within the next 6 hours.

Explanation (Optional): "A" is correct, since two groups of heaters powered from emergency power are required, and control group "C" power is from non emergency load center 32C. "B" is action for loss of an emergency power heater group. "C" is similar to action required if pressurizer is otherwise inoperable. "D" is action for PZR level out of spec.

Technical Reference(s): Technical Spec 3.4.3.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Technical Specifications sections 3 and 4

Learning Objective: MC-05343 Given a plant condition or equipment malfunction, use provided reference material to: a. determine entry conditions to applicable plant procedures. b. evaluate technical specification applicability and determine required ACTIONS. (As available)

Question Source: Modified Bank # 0068330

Question History: Seen in program prior to modification

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.2, 43.3 / 45.3

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 119		77
K/A # 076.K1.05 Service Water System (SWS)	Tier #		2
Knowledge of the physical connections and / or	Group #		3
cause effect relationship between SWS and D/G	Importance Rating		4.0*

Proposed Question:

A loss of all AC power has occurred, and the crew is placing equipment in PULL-TO-LOCK to block automatic loading of the AC emergency busses per ECA-0.0 LOSS OF ALL AC POWER, step 6.

Which pumps will be left in AUTO, and why?

Answers

A.	Wrong	One charging pump per train, to provide RCP seal cooling.
B.	Wrong	One charging pump per train, to provide RCS inventory makeup.
C.	Correct	One service water pump per train, to provide emergency diesel generator cooling.
D.	Wrong	One service water pump per train, to provide RPCCW cooling for the RCP thermal barriers.

Explanation (Optional): One service water pump per train is left in AUTO to provide EDG cooling ("C" correct). Charging pumps are placed in PTL to prevent thermal shocking the RCP seals ("A" and "B" wrong). Thermal barrier cooling is not restored until cold shutdown to protect the RPCCW system ("D" wrong).

Technical Reference(s): WOG Bkgd doc for ECA-0.0 step 6 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-03852 Discuss the basis of major procedure steps and/or sequence of steps in EOP 35 ECA-0.0. (As available)

Question Source: New

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.41.2 to 41.9 / 45.7 to 45.8

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 120		78
K/A # GEN.2.1.2 Conduct of Operations	Tier #		3
Knowledge of operator responsibilities during all	Group #		1
modes of operation	Importance Rating		4.0

Proposed Question:

The plant is at 100% power.
The Shift Manager is on a plant tour.
The "A" Turbine Driven Main Feed Pump is out of service for seal replacement.
A PEO reports that a significant amount of oil has started spraying from the Motor Driven Main Feed Pump lube oil piping.

What is the US required to do in this situation per OP 3260 CONDUCT OF OPERATIONS?

Answers

A.	Wrong	Notify ISO prior to decreasing load.
B.	Wrong	Obtain SM approval prior to decreasing load.
C.	Correct	Consider, prior to taking action, the exposure to equipment damage versus the need for continued operation.
D.	Wrong	Station the shift technician at the fire panel to monitor and respond to alarms in order to minimize crew distractions.

Explanation (Optional): The US shall consider, prior to taking action, the exposure to equipment damage versus the need for continued operation ("C" correct). The US may station a qualified operator at the fire panel ("D" wrong). The SM approves planned load changes, but this isn't necessary when responding to emergency situations ("B" wrong). CONVEX shall be notified promptly when changing load because of plant conditions ("A" wrong).

Technical Reference(s): OP 3260 Conduct of Operations, section 1.14 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05573 Outline the duties and responsibilities of the unit supervisor (As available)

Question Source: Modified Bank # 0070421
Question History: Not seen in program
Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.41.10 / 45.13
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 121		82
K/A # GEN.2.2.10 Equipment Control	Tier #		3
Knowledge of the process for determining if the margin of	Group #		2
safety defined in tech specs is reduced by a change or test	Importance Rating		3.3

Proposed Question:

An infrequently performed test and evolution (IPTE) is about to be conducted.

What are two responsibilities of the on-duty Shift Manager for the test?

Answers

A.	Wrong	Maintain technical responsibility for performance of the procedure, and be thoroughly knowledgeable of the IPTE's impact on plant systems and operations.
B.	Wrong	Assign the management test lead, and release the procedure for performance.
C.	Wrong	Select engineering department personnel to review the procedure, and conduct the pre-evolution brief.
D.	Correct	Ensure prerequisites have been completed , and ensure performance of the procedure is terminated if any of the termination criteria is met.

Explanation (Optional): "A" is wrong, since these are responsibilities of the test engineer. "B" is wrong, since these are responsibilities of the unit director. "C" is wrong, since these are the responsibilities of the engineering manager and the management test lead. "D" is correct, since the SM releases the procedure for performance, ensures prerequisites are met, ensures termination criteria is complied with, authorizes procedure for restart following termination, and maintains responsibility for safe operation of the plant.

Technical Reference(s): DC8 Infrequently performed tests and evolutions, Att. 5. (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05572 Outline the duties and responsibilities of the shift manager (As available)

Question Source: New

Question History: None

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.43.3 / 45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 122		85
K/A # GEN.2.2.24 Equipment Control	Tier #		3
Ability to analyze the affect of maintenance	Group #		2
activities on LCO status	Importance Rating		3.8

Proposed Question:

The plant at 100% power, and the crew has removed the "A" EDG from service for preplanned heat exchanger zinc replacement. The BOP operator has verified offsite sources were energized.

What other Technical Specification ACTION is required with the "A" EDG out of service?

Answers

A.	Wrong	Demonstrate the OPERABILITY of the "B" EDG within 8 hours.
B.	Wrong	Demonstrate the OPERABILITY of the "B" EDG within 24 hours.
C.	Wrong	Restore the "A" EDG to OPERABLE within 2 hours or be in HOT STANDBY within the next 6 hours.
D.	Correct	Verify that the TDAFW Pump is OPERABLE within 2 hours or be in HOT STANDBY within the next 6 hours.

Explanation (Optional): LCO 3.8.1.1 ACTION b and d are entered. The requirement to demonstrate the OPERABILITY of the remaining EDG is not required if the diesel became inoperable due to preplanned preventative maintenance ("A" and "B" wrong). "C" is wrong since the 2 hour requirement from ACTION f is in effect if both EDGs are inoperable. "D" is correct per ACTION d.2.

Technical Reference(s): Tech Spec 3.8.1.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: Technical Specification sections 3 and 4

Learning Objective: MC-04405 Given a plant condition or equipment malfunction, use provided reference material to... evaluate Technical Specification applicability and determine required actions (As available)

Question Source: New

Question History: Not seen in program

Question Cognitive Level: Comprehension or Analysis

10 CFR Part 55 Content: 55.43.2 / 45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 123		90
K/A # GEN.2.2.26 Equipment Control	Tier #		3
Knowledge of refueling administrative requirements	Group #		2
	Importance Rating		3.7

Proposed Question:

In accordance with Technical Specifications, what is the minimum crew composition during CORE ALTERATIONS?

Answers

A.	Correct	One SS, one licensed SRO responsible for fuel handling, one licensed RO in the Control Room, and one PEO.
B.	Wrong	One licensed SRO in the Control Room, one licensed SRO responsible for fuel handling, one licensed RO in the Control Room, and two PEOs.
C.	Wrong	One licensed SRO in the Control Room, two licensed ROs, two PEOs, and an STA.
D.	Wrong	One SS, one licensed RO in the Control Room, and one PEO.

Explanation (Optional): Table 6.2-1 requires 1 SS, 1 RO, and 1 PEO in MODEs 5 or 6 ("B" and "C" wrong). Tech Spec 6.2.2 requires a licensed operator in the control room whenever there is fuel in the reactor, and a licensed SRO responsible for supervising and observing CORE ALTERATIONS ("C" and "D" wrong).

Technical Reference(s): Tech Spec 6.2.2, Table 6.2.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05792 State minimum shift crew composition for all MODES of operation including requirements regarding health physics technicians, observation and supervision of CORE ALTERATIONS, fire brigade composition, and unexpected absences. (As available)

Question Source: Old Bank # 207

Question History: Not seen in program

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.43.5 / 45.13

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 124		92
K/A # GEN.2.2.22 Equipment Control	Tier #		3
Knowledge of limiting conditions for operations	Group #		2
and safety limits	Importance Rating		4.1

Proposed Question:

The unit is at 100% power when a large loss of load event occurs. RCS pressure reaches 2780 psia, and the reactor does not trip.

How long does the crew have per Tech Specs to be in HOT STANDBY with RCS pressure within its limits?

Answers

A.	Wrong	5 minutes
B.	Wrong	15 minutes
C.	Correct	1 hour
D.	Wrong	6 hours

Explanation (Optional): Tech Spec 2.1.2 requires the plant to be in HOT STANDBY with RCS pressure within its limits within 1 hour when in MODE 1.

Technical Reference(s): Tech Spec 2.1.2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05793 Describe any ACTIONS that must be taken... if a safety limit is violated. (As available)

Question Source: Modified Bank # 0067466

Question History: Seen in program and 95 NRC exam prior to modification

Question Cognitive Level: Memory or Fundamental Knowledge

10 CFR Part 55 Content: 55.43.2 / 45.2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 125		98
K/A # GEN.2.4.18 Emergency Procedures / Plan	Tier #		3
Knowledge of specific basis for EOPs	Group #		4
	Importance Rating		3.6

Proposed Question:
The following events are in progress:

- A tube rupture has occurred on the "C" Steam Generator.
- The crew is currently performing EOP 35 ES-3.1 POST SGTR COOLDOWN USING BACKFILL.
- The "B" RCP is running.
- During backfill the crew inadvertently allows the "C" Steam Generator narrow range level to go offscale low.

Which of the following is a potential negative consequence of this action?

Answers

A.	Correct	SG depressurization will occur, reinitiating primary to secondary leakage.
B.	Wrong	Dilution from excess back leakage will result in transition to EOP 35 FR-S.1 ATWS.
C.	Wrong	Pressurizer level will fall below the minimum value, resulting in an automatic reinitiation of SI.
D.	Wrong	Heat removal from the RCS will be reduced such that the optimal cooldown rate CANNOT be maintained.

Explanation (Optional): If the U-Tubes uncover, the ruptured SG pressure cold rapidly decrease and reinitiate break flow ("A" correct). Re-criticality is a concern in the event when first RCP started is in the ruptured loop following natural circulation ("B" wrong). Pressurizer level is a concern but auto SI is blocked ("C" wrong). Heat removal is accomplished through the intact SGs ("D" wrong).

Technical Reference(s): EOP 35 ES-3.1 Basis, WOG Bkgd Doc (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: MC-05535 Discuss the basis of major procedure steps and/or sequence of steps in EOP 35 ES-3.1. (As available)

Question Source: New
Question History: Catawba NRC exam
Question Cognitive Level: Comprehension or Analysis
10 CFR Part 55 Content: 55.41.10 / 45.13
Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Question record # 126		100
K/A # GEN.2.4.41 Emergency Procedures / Plan	Tier #		3
Knowledge of EAL thresholds and classifications	Group #		4
	Importance Rating		4.1

Proposed Question:
The plant was initially at 100% power when the following sequence of events occurs:

Time	Event
0800	A reactor trip and safety injection occurs due to a tube rupture on the "B" SG.
0811	The low setpoint safety valve on the "B" SG lifts and fails to reseat.
0813	The "B" SG radiation monitor 3MSS*RE76 indicates 0.5 uCi/cc.
0823	"B" SG narrow range level goes offscale high.
0827	3MSS*RE76 indicates 5.0 uCi/cc.
0840	Maintenance is dispatched to attempt to locally close the "B" SG safety valve.
0849	3MSS*RE76 indicates 7.0 uCi/cc.
0853	Maintenance reports that the "B" SG safety valve has been gagged shut.

What is the classification of this event?

Answers

A.	Wrong	GENERAL EMERGENCY - ALPHA
B.	Correct	SITE AREA EMERGENCY - CHARLIE 2
C.	Wrong	ALERT - CHARLIE 1
D.	Wrong	UNUSUAL EVENT - DELTA 2

Justification (Optional): Loss of RCS barrier (RCB4) and CTMT barrier (CNB4). Also, offsite release column shows Site Area Emerg based on OS1.3, since 3MSS*RE76 $\geq$0.8 uCi/cc for >15 minutes. Not General Emergency since < 20 uCi/cc.

Technical Reference(s): MP3 EAL Tables (Attach if not previously provided)
Proposed references to be provided to applicants during examination: MP3 EAL Tables
Learning Objective: MC-04374 Given a plant condition requiring the use of EOP 35 E-3, classify the event in accordance with EPIP 4400. (As available)
Question Source: Modified Bank # MP3-EAL-977-4K
Question History: Not seen in program
Question Cognitive Level: Comprehension or Analysis
10 CFR Part 55 Content: 55.43.5 / 45.11
Comments: