U. S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information	
Name:	Region: I
Date:	Facility/Unit: BVPS-1
License Level: **RO**	Reactor Type: Westinghouse PWR
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected six hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results

Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

BVPS Unit 1 Reactor Operator (2002-01)
Answer Key

1.	C	26.	A	51.	D	76.	B
2.	C	27.	A	52.	A	77.	D
3.	A	28.	B	53.	A	78.	B
4.	B	29.	B	54.	C	79.	C
5.	A	30.	B	55.	A	80.	A
6.	A	31.	B	56.	A	81.	B
7.	C	32.	B	57.	B	82.	B
8.	A	33.	B	58.	C	83.	B
9.	B	34.	D	59.	B	84.	B
10.	A	35.	A	60.	B	85.	D
11.	D	36.	B	61.	A	86.	A
12.	D	37.	C	62.	B	87.	C
13.	A	38.	B	63.	B	88.	C
14.	C	39.	C	64.	C	89.	D
15.	B	40.	A	65.	B	90.	D
16.	B	41.	B	66.	B	91.	C
17.	A	42.	B	67.	D	92.	D
18.	D	43.	C	68.	C	93.	C
19.	D	44.	B	69.	A	94.	A
20.	C	45.	A	70.	D	95.	B
21.	B	46.	D	71.	D	96.	D
22.	B	47.	A	72.	B	97.	C
23.	C	48.	B	73.	A	98.	A
24.	B	49.	C	74.	C	99.	C
25.	A	50.	B	75.	C	100.	D

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		001K4.17	
	Importance Rating	2.9	3.1

Knowledge of CRDS design feature(s) and/or interlock(s), which provide for the following: Override (bypass) for rod bank motion when one rod is bottomed.

Proposed Question: Common 1

Given the following conditions:

- The Unit is at 85% power. All systems are in NSA.
- A Control Bank "D", Group 2 rod drops to the bottom of the core.
- The plant is stabilized, the cause of the failure identified and repaired.

Which one of the following describes the method for retrieving the dropped rod in accordance with 1OM-1.4.X, RCCA or RCCA Group Misalignment?

A. All rods in group 2 except the affected rod are disconnected. Control Bank "D", Group 1 rods remain connected. The Group 2 Step Counter is set to the dropped rod position prior to retrieval. The affected rod is withdrawn until the Group 2 Step Counter matches the Group 1 Step Counter.

B. All rods in Control Bank "D", Group 1 and Group 2, except the affected rod are disconnected. The Step Counter for Group 2 is set to the dropped rod position. The Step Counter for Group 1 is left at its current position. The affected rod is withdrawn until Group 1 and Group 2 Demand are equal.

C. All rods in Control Bank "D", Group 1 and Group 2, except the affected rod are disconnected. The Step Counters for Group 1 and Group 2 are set to the dropped rod position. The affected rod is withdrawn until the Step Counters match the initial bank position.

D. All rods in group 2 except the affected rod are disconnected. Control Bank "D", Group 1 rods remain connected. The Step Counters for Group 1 and Group 2 are set to the dropped rod position. The affected rod is withdrawn until the Step Counters match the initial bank position.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. All CB D rods are disconnected except affected rod, to prevent other bank

movement. Both step counters are dialed to dropped rod position.
B. Incorrect. Group 2 step counters are also placed at the dropped rod position.
C. Correct.
D. Incorrect. All CB D rods disconnected, both groups.

Technical Reference(s): 1OM-1.4.X (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53.C.1 Objective 5 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		001K3.01	
	Importance Rating	2.9	3.0

Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: CVCS

Proposed Question: Common 2

The Unit is operating at 100% power, NSA when the following indications are observed.

- Control Bank "D" Rod F-6 position indicates '0' steps.
- Rod bottom rod drop alarm is received.

If rod F-6 is the only rod bottom light lit and the Unit remains on-line, which one of the following describes the INITIAL automatic response of the CVCS system?

A. Letdown flow is increased.

B. Letdown flow is decreased.

C. Charging flow is increased.

D. Charging flow is decreased.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Letdown flow passes through a restricting orifice, which maintains letdown flow essentially constant.
B. Incorrect. Letdown flow passes through a restricting orifice, which maintains letdown flow essentially constant.
C. Correct. When the control rod is dropped, Rx power will decrease, and with turbine load initially unaffected, RCS T_{avg} will lower. As RCS T_{avg} drops, PRZR level will decrease, and charging flow will increase as a result.
D. Incorrect. When the control rod is dropped, Rx power will decrease, and with turbine load initially unaffected, RCS T_{avg} will lower. As RCS T_{avg} drops, PRZR level will decrease, and charging flow will increase as a result.

Technical Reference(s): AOP-1.1.8 (Attach if not previously provided)
1OM-7.1.C

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-7.1 Objective 21 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		003A2.02	
	Importance Rating	3.7	3.9

Ability to (a) predict the impacts of the following malfunctions or operations on the Reactor Coolant Pump System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP

Proposed Question: Common 3

Given the following conditions:

- The Unit is in Mode 3.
- A reactor startup is in progress.
- Shutdown Bank "A" is fully withdrawn.
- Shutdown Bank "B" is being withdrawn.
- The following annunciator is received in the control room:
  - [A3-82], REACTOR COOL PP BRG OIL RESERVOIR LOW
- The startup is stopped while a containment entry is made to investigate.

The operator in containment reports a large oil leak in the vicinity of 1A RCP, and recommends tripping the pump.

Which one of the following describes the action required?

A. Trip 1A RCP and refer to the Alarm Response Procedure for 1A RCP Low Flow.

B. Trip the reactor, trip 1A RCP, and refer to the Alarm Response Procedure for 1A RCP Low Flow.

C. Trip the reactor, perform Immediate Operator Actions of E-0, Reactor Trip or Safety Injection, trip 1A RCP, and continue in E-0.

D. Monitor 1A RCP bearing temperatures. If any bearing temperature exceeds 275°F, trip the RCP and refer to the alarm response procedure for RCP Bearing High Temperature.

Proposed Answer: A

Explanation (Optional):

A. Correct. No action required for reactor trip or shutdown because the plant is already in Mode 3.
B. Incorrect. Reactor Trip not required. Subcritical withdrawing SD banks.
C. Incorrect. Reactor trip not required. E-0 entry not required.
D. Incorrect. Do not allow bearing temperatures to exceed alarm setpoint of 185°F.

Technical Reference(s): 1OM-6.4.AAI (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-6.3 Objective 21 (As available)

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

Question History: 1LOT4 NRC Question #55

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	003A3.05	
	Importance Rating	2.7	2.6

Ability to monitor automatic operation of the RCPs, including: RCP lube oil and bearing lift pumps.

Proposed Question: Common 4

The following conditions exist for starting a Reactor Coolant Pump (RCP):

- Local Lift Oil Pump control switch in AUTO
- RCP control switch placed in START and released.

Which one of the following describes the sequence of events that will take place to start the RCP?

A. Lift Oil Pump starts. After 50 seconds, RCP starts. 2 minutes later the Lift Oil Pump stops.

B. Lift Oil Pump starts. After 2 minutes, RCP starts. 50 seconds later the Lift Oil Pump stops.

C. After 50 seconds the Lift Oil Pump starts. 2 minutes later the RCP starts. 50 seconds, the Lift Oil Pump stops.

D. After 50 seconds the Lift Oil Pump starts. After 50 seconds the RCP starts. 2 minutes later the Lift Oil Pump stops.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. RCP timer and lift pump timer are reversed.
B. Correct.
C. Incorrect. No time delay for Oil Lift Pump.
D. Incorrect. No time delay for Oil Lift Pump and timers reversed for RCP and oil lift pump.

All plausible because each distractor starts Lift Pump first. Candidate must know timers.

Technical Reference(s): RCS Logic diagrams LSK-25-1A & 1B (Attach if not previously provided)
1OM-6.4A

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-6.3-09 (As available)

Question Source: Bank # _____
Modified Bank # 1SQS-6.3-09-01 (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		004K1.06	
	Importance Rating	3.1	3.1

Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: Makeup system to VCT.

Proposed Question: Common 5

The Unit is operating at 100% power NSA, when the [LT-1CH-112] VCT Level Transmitter fails high.

After an extended period of operation, the following conditions result.

- [A3-53], VOLUME CONTROL TANK LEVEL HIGH-LOW alarms
- VCT level indicates approximately 5%.

Assuming no action by the crew, which one of the following describes the expected automatic plant response?

A. Charging pump suctions from the VCT remain open; the charging pumps will eventually lose suction because the RWST suction valves remain closed.

B. Charging pump suctions from the VCT will close; the charging pumps will lose suction because the RWST suction valves remain closed.

C. Charging pump suctions from the VCT remain open; the charging pumps will continue to operate normally because the RWST suction valves also open on Low VCT level.

D. Charging pump suctions from the VCT will close; the charging pumps will continue to operate normally because the RWST suction valves open on low VCT level.

Proposed Answer: A

Explanation (Optional):

A. Correct. As a result of this failure, level control valves [LCV-1CH-115A] and [LCV-1CH-112] modulate open, diverting flow to the boron recovery system; thus, actual VCT level will lower. [LT-1CH-115] provided the VCT Hi-Lo level alarm and the control room indication that VCT level is 5%. However, because both LT-1CH-112 and LT-1CH-115 must sense level at 5% for the automatic transfer of the charging pump suctions to the RWST to occur, the charging pumps will remain aligned to the VCT, eventually losing pump suction.
B. Incorrect. 2/2 level transmitters required for any swapover function.
C. Incorrect. 2/2 level transmitters required for swapover functions.
D. Incorrect. Description of 2/2 level transmitters below 5%. LT-112 is still failed high.

Technical Reference(s): 1OM-7.4.AAX (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-7.1 Objective 17 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		004K5.08	
	Importance Rating	2.6	3.2

Knowledge of the operational implications of the following concepts as they apply to the CVCS: Estimation of subcritical multiplication factor (K-eff) by means other than the 6-factor formula: relationship of count rate changes to reactivity changes.

Proposed Question: Common 6

The crew is performing a dilution in preparation for rod withdrawal to criticality.

If Keff is approximately .99 when the dilution is started, at what point in the dilution can the crew determine that Keff is approximately .995?

A. When the Source Range counts double from their initial value.

B. When there is a stable startup rate with no change in the dilution flow rate.

C. When Control Bank 'A' control rods are withdrawn from the core.

D. When the Source Range counts double 2 - 3 times from their initial value.

Proposed Answer: A

Explanation (Optional):

A. Correct. Rule of thumb, double counts, half way to critical.
B. Incorrect. Partial description of criticality.
C. Incorrect. Although TS Mode 2 is Keff > .99, that is not the correct way to estimate half way to critical.
D. Incorrect. Based upon the thumb rule that 5 - 6 doublings make the reactor critical, this distractor cuts that value in half for half way to critical.

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

_____

_____

Proposed References to be provided to applicants during examination: NONE

Learning Objective: Generic Fundamentals (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		061A1.01	
	Importance Rating	3.9	4.2

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: S/G level

Proposed Question: Common 7

Given the following conditions:

- An ATWS has occurred.
- The crew is performing the actions of FR-S.1, Response to Nuclear Power Generation/ATWS.
- All steam generator narrow range levels are off-scale LOW.

Which one of the following describes the required operation of the AFW system, and why?

A. Operate all available AFW pumps to establish total flow of 355 gpm; to maintain minimum heat sink and restore SG levels.

B. Operate motor driven AFW pumps only to establish total flow of 355 gpm; to minimize effects of RCS cooldown on reactivity.

C. Operate all available AFW pumps to establish total flow of 630 gpm; to maintain minimum heat sink and restore SG levels.

D. Operate motor driven AFW pumps only to establish total flow of 630 gpm; to minimize effects of RCS cooldown on reactivity.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. 355 normal AFW minimum. 630 required if SG levels < 13%.
B. Incorrect. All pumps operated. Reason is wrong for plant conditions. Value is wrong for plant conditions.
C. Correct. Operate 3 pumps at a flow of 630 gpm to maintain secondary inventory.
D. Incorrect. Operate all 3 pumps. Reason is wrong, but would be valid for a situation where FR-S.1 is entered later in an event due to cooldown, where the 630 gpm flow limit

does not apply because SG levels may already be established. In that case, additional AFW flow would make the problem worse.

Technical Reference(s): FR-S.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		013A4.01	
	Importance Rating	4.5	4.8

Ability to manually operate and/or monitor in the control room: ESFAS initiated equipment which fails to actuate

Proposed Question: Common 8

Given the following conditions:

- The Unit was operating at 100% power.
- A PORV failed open.
- The reactor has tripped on low pressurizer pressure.
- Pressurizer pressure stabilizes at 1700 psig.

Plant status is as follows:

- All control rods are fully inserted.
- Status light "S Inj Act Sig" not LIT at Panel 62, C-4.
- Normally running Charging pump is in service.
- Standby Charging pump not running,
- No LHSI pumps running.
- CIA not actuated.
- CIB not actuated.
- Main Steam Lines not isolated.
- Feedwater Isolation not actuated.

Which one of the following describes the required manual operator actions?

Manually initiate both trains of ...

A. Safety Injection.

B. Safety Injection and CIB.

C. Safety Injection, CIB, and Main Steam Line Isolation.

D. Safety Injection, CIB, Main Steam Line Isolation, and CIA.

Proposed Answer: A

Explanation (Optional):

A. Correct. When PRZR pressure drops below 1845 psig SIS should have actuated, which would result in Safety Injection, CIA, and feedwater isolation. Manual actuation of SI should start the non-running HHSI and LHSI pumps as well as actuate CIA and the Feedwater

Isolation.
B. Incorrect. CIB is not actuated on low PRZR pressure.
C. Incorrect. CIB and MSL Isolation are not actuated on low PRZR pressure.
D. Incorrect. CIB and MSL Isolation are not actuated on low PRZR pressure. CIA will actuate when SI is initiated.

Technical Reference(s): E-0 (Attach if not previously provided)
Att 1-K
1OM-1.2B

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 10 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	015K5.02	
	Importance Rating	2.7	2.9

Knowledge of the operational implications of the following concepts as they apply to the NIS: Discriminator/compensation operation.

Proposed Question: Common 9

Which one of the following contains BOTH conditions that will result in indicated reactor power being LOWER than actual reactor power?

A. Source Range pulse height discrimination set too LOW
Intermediate Range Compensating voltage set too LOW

B. Source Range pulse height discrimination set too HIGH
Intermediate Range Compensating voltage set too HIGH

C. Source Range pulse height discrimination set too LOW
Intermediate Range Compensating voltage set too HIGH

D. Source Range pulse height discrimination set too HIGH
Intermediate Range Compensating voltage set too LOW

Proposed Answer: B

Explanation (Optional):

A. Incorrect. If pulse height discrimination is set too low, then more gamma pulses will be counted, resulting in an indicated reading higher than actual. If IR compensating voltage is set too low, the detector will have a higher output, resulting in a higher power indication.
B. Correct.
C. Incorrect. See explanation for 'A' above.
D. Incorrect. See explanation for 'A' above.

Technical Reference(s): 1OM-2.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1, Objective 2.c (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	015A3.01	
	Importance Rating	3.8	3.8

Ability to monitor automatic operation of the NIS, including: Console and cabinet indications.

Proposed Question: Common 10

Following a Unit trip, Intermediate Range Startup rate is approximately -1/3 decade per minute on both channels.

Current indication on Intermediate Range channels are as follows:

- N35 = $5E^{-7}$ amps
- N36 = $2E^{-8}$ amps

Based upon the above indications, which one of the following describes the expected sequence for Source Range channel N31 and N32 energization?

A. Both Source Range channels will energize when N35 reaches its setpoint

B. Both Source Range channels will energize when N36 reaches its setpoint

C. N31 will energize when N35 reaches its setpoint. N32 will energize when N36 reaches its setpoint

D. N31 will energize when N36 reaches its setpoint. N32 will energize when N35 reaches its setpoint

Proposed Answer: A

Explanation (Optional):

A. Correct. N35 reads higher, so at the same startup rate, it will take longer to reach the SR energization setpoint of 10-10 amps.
B. Incorrect. 2 out of 2 required to energize SR instruments.
C. Incorrect. SR not off individual detectors, they are energized based on permissive.
D. Incorrect. SR not off individual detectors, they are energized based on permissive.

Technical Reference(s): 1OM-2.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1 Objective 8 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
		014A4.01	
	Importance Rating	3.3	3.1

Ability to manually operate and/or monitor in the Control Room: Rod selection control.

Proposed Question: Common 11

Given the following conditions:

- The Unit is in Mode 1. All systems are in NSA.
- All Tavg channels are approximately 3°F higher than Tref.

Which one of the following modes on the Rod Control System Mode Selector Switch will provide the FASTEST rod speed if rod motion is demanded?

A. Manual

B. Automatic

C. Control Bank 'A'

D. Shutdown Bank 'A'

Proposed Answer: D

Explanation (Optional):

A. Incorrect. 48 spm.
B. Incorrect. 3 degree mismatch will move bank 'D' rods at approximately 40 spm (8 - 72 spm band).
C. Incorrect. 48 spm.
D. Correct. 64 spm, is adjustable.

Technical Reference(s): 1OM-1.2.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1C Objective 10 (As available)

Question Source: Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: 3SQS-1.3-010-1

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		017K1.01	
	Importance Rating	3.2	3.2

Knowledge of the physical connections and/or cause effect relationships between the ITM system and the following systems: Plant computer.

Proposed Question: Common 12

Given the following conditions:

- Reactor trip has occurred from 100% power.
- Actions of E-0, Reactor Trip or Safety Injection, are being performed.
- The crew is checking if SI flow should be terminated when it is determined that RCS subcooling on ICCM is less than the required 43°F.

With subcooling on ICCM less than the required 43°F, the crew is required to check RCS subcooling based on core exit TCs.

Which one of the following describes the method used to determine whether RCS subcooling is adequate?

A. Minimum required subcooling is determined using the SPDS; actual RCS subcooling is calculated by the IPC.

B. Actual RCS subcooling is determined using Main Control board indications; minimum required subcooling is determined by the SPDS.

C. Minimum required subcooling is determined using an EOP Attachment; RCS subcooling is determined using Main Control Board indications.

D. RCS subcooling is determined using the SPDS; minimum required subcooling is determined using an EOP attachment.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Required subcooling determined by Attachment 6-A.
B. Incorrect. No CETs on Main Control Board.
C. Incorrect. No CETs on Main Control Board.
D. Correct. RCS subcooling can be read on the IPC. Minimum required subcooling is determined using EOP attachment 6-A, 0°F plus Subcooling Based on Core Exit TCs.

Technical Reference(s): E-0
Attachment 6-A
1OM-3.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		022K4.04	
	Importance Rating	2.8	3.1

Knowledge of Containment Cooling System design features and/or interlocks which provide for the following: Cooling of Control Rod Drive Motors

Proposed Question: Common 13

Which one of the following correctly completes the following description of CRDM Shroud Cooling Fan operation?

With all plant systems in their normal alignments, [1VS-F-2C], CRDM Shroud Fan would start in the _____ if [1VS-F-2A], CRDM Shroud Fan is not racked in on bus _____, and the diesel loading sequence signal is received.

A. auto mode; 8N

B. auto mode; 8P

C. manual mode; 8N

D. manual mode; 8P

Proposed Answer: A

Explanation (Optional):
A. Correct. 2C will start if 2A not available, 2C in auto, and DG sequence signal received.
B. Incorrect. Wrong bus.
C. Incorrect. Wrong mode.
D. Incorrect. Wrong mode and wrong bus.

Technical Reference(s): 1OM-44C.1.E (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-44.C.1 Objective 4 (As available)

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

New: X

Question History:

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

10 CFR Part 55 Content: 55.41: X
55.43:

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		022A1.01	
	Importance Rating	3.6	3.7

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

Proposed Question: Common 14

Given the following conditions:

- A Loss of Off-Site power has occurred.
- All equipment has started and is operating as designed.

Which one of the following describes how Containment temperature is controlled under these conditions?

A. All Containment Air Recirculation Fans automatically sequence onto the EDGs.

B. Containment Air Recirculation Fans will automatically start when their control switches are placed in 'AUTO AFTER STOP'.

C. Containment Air Recirculation Fans must be manually started as necessary to control Containment temperature.

D. Containment Air Recirculation Fans 'A' and 'B' automatically sequence onto the EDGs. Fan 'C' must be manually started on the bus it is aligned to.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. No sequence on Loss of Power.
B. Incorrect. No Auto operation to start fans is available.
C. Correct.
D. Incorrect. Fan 'C' is a swing fan for either bus. None of the fans will auto start, but 'C' will start in manual.

Technical Reference(s): 1OM-44.C.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1OM-44.C.1 Objective 13 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
		026K2.02	
	Importance Rating	2.7	2.9

Knowledge of bus power supplies to the following: MOVs.

Proposed Question: Common 15

The Unit is operating at 80% power. All systems are in NSA.

Smoke is detected in the vicinity of MCC1-E5, and as a result, MCC1-E5 is deenergized.

Subsequently, a LOCA inside Containment results in a Reactor Trip, Safety Injection, and Containment Spray Actuation.

Which one of the following describes the response of the Quench Spray System?

Quench Spray Pump...

A. "A" starts and injects. "B" starts but does not provide spray flow.

B. "B" starts and injects. "A" starts but does not provide spray flow.

C. "A" and "B" both start, but neither train provides spray flow.

D. "A" and "B" both start, and both trains provide spray flow.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Wrong train.
B. Correct. MCC1-E5 powers the "A" Quench Spray Pump Discharge Valve [MOV-1QS-101A]. MOV-1QS-101A is normally closed and auto opens in the event of a CIB initiation signal. With MCC1-E5 deenergized, MOV-1QS-101A cannot open; therefore, Quench Spray Pump "A" does not inject. Both Quench Spray Pumps and the "B" Quench Spray Pump Discharge Valve [MOV-1QS-101B] are unaffected when MCC1-E5 is deenergized.
C. Incorrect. Train 'B' injects.
D. Incorrect. Train 'A' does not provide spray flow.

Technical Reference(s): 1OM-13.3.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-13.1 Objective 19 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
		026A4.05	
	Importance Rating	3.5	3.5

Ability to manually operate and/or monitor in the Control Room: Containment spray reset switches.

Proposed Question: Common 16

Given the following conditions:

- A LOCA has occurred
- The following Safeguards actuations have initiated:
  - SI
  - CIA
  - CIB
  - MSLI
- All equipment is operating as designed.

Which one of the following describes the manipulations necessary to allow stopping a Quench Spray Pump?

A. Reset SI only.

B. Reset CIB only.

C. Reset SI and CIA. (Both required)

D. Reset SI, CIA, and CIB. (All required)

Proposed Answer: B

Explanation (Optional):

A. Incorrect. QSS does not start on SI.
B. Correct.
C. Incorrect. Neither SI nor CIA are in the start circuit for QSS.
D. Incorrect. Neither SI nor CIA are in the start circuit for QSS.

Technical Reference(s): 1OM-13.1.C (Attach if not previously provided)

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Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-13.1 Objective 17 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		002A1.13	
	Importance Rating	3.4	4.0

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCS controls including: Core exit thermocouples.

Proposed Question: Common 17

Given the following conditions:

- Following a reactor trip due to a complete loss of CCR, all reactor coolant pumps are stopped.
- All systems are operating as designed.

Which one of the following describes the expected response of the core exit thermocouples following trip of the RCPs?

Core exit temperature initially _____ and then _____.

A. rises; drops

B. drops; rises

C. rises; stabilizes

D. drops; stabilizes

Proposed Answer: A

Explanation (Optional):

A. Correct. Core exit temperature initially rises when the RCPs are stopped due to less flow through the core. As natural circulation flow is established, core exit temperature will then lower as core Delta-T lowers. Delta-T is lowering because decay heat load is also lowering. Tcold will stay at steam dump pressure setpoint, so Delta-T drops by Thot and CETs dropping.
B. Incorrect. CETs rise for a period following the trip.
C. Incorrect. CETs do not stabilize if all systems operate as designed. They will drop because of steam dump load and decay heat.
D. Incorrect. CETs do not drop when RCPs are tripped.

Technical Reference(s): Simulator Response (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-3.1 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		006K6.05	
	Importance Rating	3.0	3.5

Knowledge of the effect of a loss or malfunction of the following will have on the ECCS: HPI/LPI cooling water.

Proposed Question: Common 18

With the Unit operating at 80% power, with all systems in NSA, the [1WR-P-1A], Reactor Plant River Water Pump trips.

Which one of the following describes the operational impact on the ECCS?

Reactor Plant River Water is available to the...

A. "B"LHSI pump [1SI-P-1B] only.

B. "B" HHSI Pump [1CH-P-1B] only.

C. "A"LHSI pump [1SI-P-1A] and the "B"LHSI pump [1SI-P-1B].

D. "A" HHSI Pump [1CH-P-1A] and the "B" HHSI Pump [1CH-P-1B].

Proposed Answer: D

Explanation (Optional):

A. Incorrect. River water does not cool LHSI Pumps.
B. Incorrect. Both river water headers supply each HHSI Pump.
C. Incorrect. River water does not cool LHSI Pumps.
D. Correct. Both river water headers supply each HHSI Pump.

Technical Reference(s): 1OM-7.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-11.1 Objective 15 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		006A1.14	
	Importance Rating	3.6	3.9

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: Reactor vessel level.

Proposed Question: Common 19

Given the following conditions:

- A LOCA has occurred.
- The crew is performing actions of ES-1.2, Post LOCA Cooldown and Depressurization.
- Pressurizer level is stable at 58%.
- RCS Pressure is stable at 1680 psig.
- The US determines that a Charging/HHSI pump can be stopped in accordance with Attachment 7-A, Criteria For Stopping 1 of 2 Running Charging/HHSI Pumps, Subcooled Conditions.

When the RO stops the Charging/HHSI Pump, which one of the following describes the expected Pressurizer level response?

A. PRZR level will remain at its current value.

B. PRZR level will rise until charging is realigned to the VCT.

C. PRZR level will drop until normal charging and letdown are restored.

D. PRZR level will drop until RCS pressure stabilizes at a lower value, then will stabilize.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. If level is currently stable, it will drop until break flow equals makeup flow at the new, lower RCS pressure.
B. Incorrect. Level will not rise if one source of makeup is taken away unless the break was isolated, as in ECA-1.2.
C. Incorrect. Level will drop, but reason is independent of normal makeup.
D. Correct. Less flow, inventory and subcooling will drop until a new break flow at a new pressure is reached.

Technical Reference(s): ES-1.2 Step 17 (Attach if not previously provided)
Att 7-A

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		073K1.01	
	Importance Rating	3.6	3.9

Knowledge of the physical connections and/or cause-effect relationships between the PRM system and the following systems: Those systems served by PRMs

Proposed Question: Common 20

Given the following:

- The Unit is operating at 90% power with all systems in NSA.
- [GW-TK-1A], Gaseous Waste Decay Tank discharge is in progress.
- [1GW-F-1A], GW Disposal Blower is operating.
- [TV-1GW-103], GW Decay Tank Disch to CTWR Valve is open.
- [TV-1GW-103A2], GW Decay Tank Bleed Valve is open.
- [1GW-D-1-1A], GW Disposal Damper associated with the "A" GW Disposal Blower [1GW-F-1A] is open.

Then, the GW Disposal Blower Discharge radiation monitor [RM-1GW-108B] alarms on High-High Gaseous Activity.

Which one of the following completely describes the Gaseous Waste System automatic response?

A. [1GW-F-1A], GW Disposal Blower trips.

B. [1GW-D-1-1A], GW Disposal Damper shuts.

C. Valve [TV-1GW-103] and valve [TV-1GW-103A2] shut.

D. Blower [1GW-F-1A] trips and Damper [1GW-D-1-1A] shuts.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. GW Disposal Blower unaffected by RM-1GW-108B.
B. Incorrect. GW Disposal Damper unaffected by RM-1GW-108B.
C. Correct. [TV-1GW-103] and [TV-1GW-103A2] automatically shut on High-High Radiation as detected by RM-1GW-108B or RM-1GW-108A..
D. Incorrect. Blower and damper both unaffected.

Technical Reference(s): 1OM-43.1.E (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-43.1 Objective 2 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		011K2.01	
	Importance Rating	3.1	3.2

Knowledge of bus power supplies to the following: Charging pumps.

Proposed Question: Common 21

The Unit is operating at 80% power with all systems in NSA, when a Small Break LOCA in containment results in a reactor trip and an SI signal.

- 4160 Volt Emergency Bus 1AE supply breaker from off-site power trips.
- No. 1 EDG fails to start.

Which one of the following describes the expected status of the Charging Pumps?

Charging Pump A _____; Charging Pump B _____.

A. running; running

B. not running; running

C. running; not running

D. not running; not running

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Charging Pump "A" has no power.
B. Correct. 4160 Volt Emergency Bus 1AE powers the "A" Charging Pump. The "B" Charging Pump is powered by 4160 Volt Emergency Bus 1DF. When Bus 1AE is deenergized, the "A" Charging Pump will trip. The "B" Charging Pump will be automatically started by the safety injection signal.
C. Incorrect. Opposite of actual response.
D. Incorrect. Charging Pump "B" has a start signal and power available, so it will run.

Technical Reference(s): 1OM-7.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-7.1 Objective 19b (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		011K5.15	
	Importance Rating	3.6	4.0

Knowledge of the operational implications of the following concepts as they apply to the PZR LCS: PZR level indication when RCS is saturated.

Proposed Question: Common 22

Given the following conditions:

- A Loss of Off-Site Power has occurred.
- RCS cooldown is being performed in accordance with ES-0.2, Natural Circulation Cooldown.
- Reactor Coolant Pumps cannot yet be started.
- The RO is depressurizing using auxiliary spray.
- Pressurizer level rapidly rises from 24% to 66%.

Which one of the following describes the reason for the pressurizer level increase?

A. Loss of Secondary Heat Sink

B. Portions of the RCS have reached saturation temperature.

C. HHSI flow is refilling the Pressurizer as RCS pressure drops.

D. Cooldown rate is not high enough to maintain Pressurizer level with auxiliary spray in service.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Loss of Heat Sink will cause RCS heatup and level increase, but not the rapid rise seen here.
B. Correct.
C. Incorrect. HHSI is not running if the crew is in ES-0.2.
D. Incorrect. Auxiliary spray will not cause pressurizer level increase during cooldown IAW ES-0.2.

Technical Reference(s): ES-0.2 Step 18 (Attach if not previously provided)

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Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		012K4.06	
	Importance Rating	3.2	3.5

Knowledge of RPS design feature(s) and/or interlock(s): Automatic or manual enable/disable of RPS trips.

Proposed Question: Common 23

Given the following:

- A Unit startup is in progress and all Nuclear Instrumentation is observed to be operating normally.
- Power Range Channel N-43 is 11%.
- Power Range Channel N-41, N-42 and N-44 are 9%.

Which one of the following is correct concerning RPS trips?

A. Power Range, high setpoint trip and Source Range high flux trip are enabled.

B. Power Range, low setpoint trip and Source Range high flux trip are disabled.

C. Power Range, high setpoint trip and Intermediate Range high flux trip are enabled.

D. Power Range, low setpoint trip and Intermediate Range high flux trip are disabled.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Power Range, high range, high level trip is always active; however, the Source Range high level trip is bypassed when power is above P6, which would be the case with power ranges indicating approximately 10%.
B. Incorrect. Power Range, low range, high level trip is active with < 2 power range channels above P10 (10% power); however, the Source Range high level trip is bypassed when power is above P6, which would be the case with power ranges indicating approximately 10%.
C. Correct. Power Range, high range, high level trip is always active, and the Intermediate Range high level trip are enabled with < 2 power range channels above P10 (10% power).
D. Incorrect. Power Range, low range, high level trip is active with < 2 power range channels above P10 (10% power), and the Intermediate Range high level trip are enabled with < 2 power range channels above P10 (10% power).

Technical Reference(s): 1OM-1.2B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 7 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		012K6.06	
	Importance Rating	2.7	2.8

Knowledge of the effect that a loss or malfunction of the following will have on the RPS: Sensors and detectors

Proposed Question: Common 24

Given the following conditions:

- The Unit was operating at 68% power.
- An automatic reactor trip occurred.
- The cause of the trip was low RCS flow in Loop 'A'.
- The cause of the trip was determined to be an instrument failure.

Which one of the following input failures caused the reactor trip?

A. The Loop 'A' high pressure side flow input failed high.

B. The Loop 'A' high pressure side flow input failed low.

C. One Loop 'A' low pressure side flow input failed high.

D. One Loop 'A' low pressure side flow input failed low.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. High side input will indicate high DP and high flow.
B. Correct. Each flow transmitter takes input from 1 high side tap and 3 low side taps. If the high side tap fails low, then all 3 DPs indicate low, satisfying the 2/3 logic for 1 loop low flow trip.
C. Incorrect. Low side tap failing high only causes 1 out of 3 low flow trips. 2 out of 3 are required for reactor trip to occur.
D. Incorrect. Low side failing low would cause a high DP and high flow indication.

Technical Reference(s): 1OM-6 Figure 6-1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 8 and 11 (As available)

Question Source: Bank # Vendor Bank
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		016K3.01	
	Importance Rating	3.4	3.6

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

Proposed Question: Common 25

Given the following conditions:

- The Unit is at 100% power. All systems are in NSA.
- [PT-1MS-446], First Stage Pressure is selected for Tref input to Rod Control System. It begins to fail DOWNSCALE.

Assuming no action by the crew, which one of the following primary plant parameters will initially INCREASE as a result of the transmitter failure?

A. Charging flow

B. RCS Tavg

C. Reactor power

D. RCS loop Delta-T

Proposed Answer: A

Explanation (Optional):

A. Correct. As first stage pressure input fails low, rods will insert. (BVPS-1 places rods in auto at 100% power). RCS temperature will decrease as a result of the rod insertion. Since there is no additional steam demand, Rx power will also decrease. If power decreases, loop Delta-T also decreases. If RCS temperature decreases, then the volume of RCS fluid also decreases, requiring additional charging flow to maintain pressurizer level on program
B. Incorrect. Tavg drops because of rod insertion.
C. Incorrect. Reactor power drops due to negative reactivity added by rods.
D. Incorrect. Loop Delta-T drops because rod control is driving Thot down, and Tcold remains relatively constant.

Technical Reference(s): 1OM-24.4.IF (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: GO-3ATA-5 Objective 7 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		035A1.02	
	Importance Rating	3.5	3.8

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Steam Generating System controls including: SG Pressure

Proposed Question: Common 26

Given the following conditions:

- A Unit startup is in progress.
- The crew is preparing to warm up the main steam lines.

Which one of the following actions will cause 'A' SG pressure to INCREASE in this plant configuration?

A. Decrease SG Atmospheric Dump Valve controller output.

B. Decrease SG Atmospheric Dump Valve controller setpoint.

C. Increase Main Steam Dump pressure controller output.

D. Increase Main Steam Dump pressure controller setpoint.

Proposed Answer: A

Explanation (Optional):

A. Correct. SG Atmospheric dump valves are operated in manual at BVPS-1. Decreasing the output will close the valve, resulting in higher SG pressure.
B. Incorrect. Changing the setpoint has no effect in manual.
C. Incorrect. Steam line warmup, condenser not yet in service.
D. Incorrect. Steam line warmup, condenser not in service yet.

Technical Reference(s): 1OM-21.1.D (Attach if not previously provided)
1OM-21 valve list

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-21.1 Objective 8 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	2
		028K6.01	
	Importance Rating	2.6	3.1

Knowledge of the effect of a loss or malfunction of the following will have on the HRPS: Hydrogen recombiners.

Proposed Question: Common 27

Given the following conditions:

- A Large Break LOCA has occurred.
- Both hydrogen recombiners are in service.
- The following control room annunciator alarms light turns OFF:
  - [A2-18], A-HYDROGEN RECOMBINER RUNNING

Which one of the following describes the effect on the removal of hydrogen from Containment?

A. Hydrogen concentration will remain below 4% with only one Recombiner in operation.

B. Hydrogen concentration will rise above 4% but remain below 13% with only one Recombiner in operation.

C. Hydrogen concentration will remain below 4% only if the Containment Purge System is placed in service in addition to the Recombiner.

D. Hydrogen concentration will remain below 4% only if Containment Spray is placed in service in addition to the Recombiner.

Proposed Answer: A

Explanation (Optional):

A. Correct. Either train will meet design function.
B. Incorrect. 4% is the limit. 13% was chosen as the approximate value for explosive mixture.
C. Incorrect. Purge system would not be placed in service as a result of a recombiner failure.
D. Incorrect. Spray will not be in service at the pressures that H2 recombiners operate at.

Technical Reference(s): 1OM-46.4.AAA (Attach if not previously provided)

1OM-46.1.A, B

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-46.1 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		033K4.02	
	Importance Rating	2.5	2.7

Knowledge of SFP Cooling design feature(s) and/or interlock(s) which provide for the following: Maintenance of spent fuel cleanliness.

Proposed Question: Common 28

The Unit is in Mode 1. All systems are in NSA.

Which one of the following describes the normal operation of the Spent Fuel Pool Purification System?

A. Two Purification Circulating pumps take suction from the Spent Fuel Pool skimmers. Each pump discharges through a separate filter and Ion Exchanger.

B. Either or both of two Purification Circulating pumps take suction from submerged piping in the Spent Fuel Pool. Each pump discharges through a separate filter and a common Ion Exchanger.

C. One Purification Circulating pump takes suction on submerged piping in the Spent Fuel Pool. The other pump is aligned for RWST purification. Each pump discharges through separate filters and Ion Exchangers.

D. One Purification pump takes suction from the Spent Fuel Pool skimmers. The other pump is aligned for RWST purification. Each pump discharges through separate filters and Ion Exchangers.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Skimmers operated intermittently as necessary.
B. Correct.
C. Incorrect. Either pump may be aligned to RWST but not normally.
D. Incorrect. Either pump may be aligned to RWST but not normally, skimmers only used when necessary.

Technical Reference(s): 1OM-20.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-20.1 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		039K5.08	
	Importance Rating	3.6	3.6

Knowledge of the operational implications of the following concepts as they apply to the MRSS: Effect of steam removal on reactivity.

Proposed Question: Common 29

Given the following conditions:

- A Unit startup is in progress following a mid-cycle outage.
- The reactor is critical at $1E^{-8}$ amps.

A Main Condenser steam dump valve fails partially open.

Assuming NO action by the crew, which one of the following describes the immediate effect on the plant?

A. Power INCREASES; RCS Temperature INCREASES.

B. Power INCREASES; RCS Temperature DECREASES.

C. Power DECREASES; RCS Temperature INCREASES.

D. Power DECREASES; RCS Temperature DECREASES.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. More steam demand will cause temperature to decrease.
B. Correct. Negative MTC (MOL). If temperature decreases, power increases.
C. Incorrect. Power increases due to negative MTC. Temperature decreases due to increased heat removal.
D. Incorrect. If MTC was positive, this would be the initial effect, but MTC is only positive at BOL high boron concentration.

Technical Reference(s): GFE – Reactor Operational Physics (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		062K4.01	
	Importance Rating	2.6	3.2

Knowledge of AC Distribution System design feature(s) and/or interlock(s) which provide for the following: Bus lockouts

Proposed Question: Common 30

Which one of the following conditions will PREVENT the No. 1 EDG output breaker from closing to energize 4KV bus 1AE following a loss of power?

A. [ACB-1A10], Emergency Bus 1AE feeder breaker has an undervoltage trip.

B. [ACB-1A10], Emergency Bus 1AE feeder breaker has an overcurrent trip.

C. [ACB-41C], Normal 4KV Bus 1A feeder breaker has an overcurrent trip with bus 1AE normal feeder breaker control switch position in "Auto After Close".

D. [ACB-41C], Normal 4KV Bus 1A feeder breaker, has an undervoltage trip with bus 1AE normal feeder breaker control switch position in "Auto After Close".

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Undervoltage would be a start signal for the EDG.
B. Correct. Bus overcurrent on 1AE will cause lockout.
C. Incorrect. Lockout on normal 4KV bus will not cause lockout on emergency bus regardless of emergency bus switch position.
D. Incorrect. Undervoltage on normal 4KV bus will cause undervoltage on emergency bus, resulting in EDG start and load, as long as no lockouts exist.

Technical Reference(s): 1OM-36.1.E (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-36.2 Objective 12 (As available)

Question Source: Bank #

Modified Bank # X (Note changes or attach parent)
New

Question History: 1LOT4 RO Audit

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
		005K5.02	
	Importance Rating	3.4	3.5

Knowledge of the operational implications of the following concepts as they apply to the RHRS: Need for adequate subcooling.

Proposed Question: Common 31

Given the following conditions:

- The Unit is in Mode 6.
- RHR is in service.
- RCS temperature is 139°F.
- RCS Boron Concentration is 1822 ppm.
- RCS drain down is in progress in preparation for refueling.

[MOV-1RH-758], RHR Heat Exchanger Flow Control Valve, begins to drift in the closed direction due to an electrical problem.

Assuming NO action by the crew, which one of the following describes the effect of this failure on plant operation?

A. RCS cooldown to a temperature below the RCS boron solubility limit.

B. Loss of NPSH to the operating RHR pump due to increased temperature.

C. OPPS actuation due to overpressurization of the RCS.

D. Loss of RHR letdown and uncontrolled RCS level increase.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. RCS will heat up when the flow control valve goes closed.
B. Correct. RCS at atmospheric pressure, temperature rising will result in loss of subcooling. Loss of subcooling means loss of NPSH.
C. Incorrect. OPPS actuation will not occur because head removal means RCS at atmospheric pressure.
D. Incorrect. The flow control valve would not affect the manually throttled RHR letdown at

this temperature, and with no inventory makeup in progress, level would not increase appreciably.

Technical Reference(s): 1OM-10.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-19.1 Objective 18 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
		005A4.04	
	Importance Rating	3.1	2.9

Ability to manually operate and/or monitor in the Control Room: Controls and indication for closed cooling water pumps.

Proposed Question: Common 32

Given the following conditions:

- The Unit is in Mode 4.
- RCS cooldown is in progress on RHR Train 'B'.
- CCR Train 'A' and Train 'B' are aligned to provide cooling water to RHR.

Which one of the following describes the flow limits placed on the CCR system in this alignment, and the method used to determine actual flow?

A. Total CCR system flow is limited to 4500 gpm. The actual flow is determined by adding the flows on the 8 inch, 14 inch, and 24 inch CCR headers.

B. Each CCR pump is limited to a total of 6500 gpm. The actual flow is determined by adding the flows on the 8 inch, 14 inch, and 24 inch CCR headers.

C. Total CCR flow through the RHR Heat Exchanger is 4500 gpm. The actual flow is determined directly from the 24 inch CCR header.

D. Total CCR flow through the RHR Heat Exchanger is 6500 gpm. The actual flow is determined directly from the 24 inch CCR header.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Flow limit is 6500. Total flow could potentially be 13,000 gpm with 2 pumps.
B. Correct.
C. Incorrect. Limit is for CCR pump total flow, not through RHR HX. Also wrong value.
D. Incorrect. Limit is for CCR pump total flow, not through RHR HX.

Technical Reference(s): 1OM-10.4.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-10.1 Objective 20 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.1.18	
	Importance Rating	2.9	3.0

Ability to make accurate, clear and concise logs, records, status boards, and reports.

Proposed Question: Common 33

Surveillance Verification Log L5 is being performed for the 0000 - 0800 shift.

The RO determines that the NIS Cabinet Power Range indication is not within allowable limits.

Which one of the following describes how this is documented on the L5 log?

A. Circle all readings in red pen that are not in compliance. US must initial the L5 log in the time column next to the unsatisfactory check.

B. Circle all readings in red pen that are not in compliance. Details of the unsatisfactory check must be documented in the remarks section. US must review the log at least once every shift.

C. Mark 'UNSAT' in the time column opposite the unsatisfactory check. Record details of the check in the remarks section. The US must review the log prior to end of shift.

D. Mark 'UNSAT' in the time column opposite the unsatisfactory check. Record details of the check in the remarks section. The US must initial the L5 log in the time column next to the UNSAT comment.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. US does not initial.
B. Correct. Red circle required for L5. US must sign once per shift.
C. Incorrect. UNSAT not marked in time column for L5 log.
D. Incorrect. US does not initial next to UNSAT. Reviews when rounds completed.

Technical Reference(s): 1OM-54.1.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-48.1 Objective 22 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.1.24	
	Importance Rating	2.8	3.1

Ability to obtain and interpret station electrical and mechanical drawings.

Proposed Question: Common 34

Given the following:

- [1QS-MR-1A], Refueling Water Refrigeration Unit is "ON."
- One refueling water recirculation pump running slow.
- [TS-1QS200A2], Refrigeration Unit Operating Thermostat is actuated.

Using the diagram provided, which one of the following describes the status of the refueling water refrigeration unit?

[1QS-MR-1A], Refueling Water Refrigeration Unit is...

A. started, and liquid line solenoid is energized to open.

B. stopped, and liquid line solenoid is energized to close.

C. started, and liquid line solenoid is deenergized to open.

D. stopped, and liquid line solenoid is deenergized to close.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Not started, but stopped.
B. Incorrect. Deenergized to close.
C. Incorrect. Energized to open, and stopped, not started.
D. Correct. TS-1QS200A2, Refrigeration Unit operating thermostat actuated is a trip signal. Any trip signal present removes the start permissive and stops the Refueling Water Refrigeration Unit. Also, the liquid line solenoid deenergized to close.

Technical Reference(s): LSK-29-5A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: LSK-29-5A

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:
Logic diagrams

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		2.1.25	
	Importance Rating	2.8	3.1

Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.

Proposed Question: Common 35

Given the following conditions:

- The Unit has been at 100% power for 3 weeks. All systems are in NSA.
- RCS boron concentration is 1100 ppm.
- A controlled power reduction to 50% is required.

Using the references provided and maintaining control rods at their current position, which one of the following describes the amount of boric acid required to initially maneuver the plant to 50% power?

A. 900 gallons

B. 1100 gallons

C. 1300 gallons

D. 1500 gallons

Proposed Answer: A

Explanation (Optional):

A. Correct. Power defect is approximately 1875 – 100 = 875 pcm. Critical Boron concentration of 1100 ppm indicates approximately 7000 MWD/MTU. Boron worth at this concentration is approximately - 6.8 pcm/ppm. Therefore, 875/ - 6.8 = 128 ppm. Using boron addition nomograph shows approximately 900 gallons of boric acid or less.
B. Incorrect. High enough to allow for minor interpretation differences on nomograph reading.
C. Incorrect. Used to provide consistent distractor and allows for minor interpretation differences.
D. Incorrect. Used to provide consistent distractor and allows for minor interpretation differences.

Technical Reference(s): Curve Book (Curves provided) (Attach if not previously provided)

Proposed References to be provided to applicants during examination: Plant Curves

Learning Objective: 1SQS-7.1 Objective 27 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Application

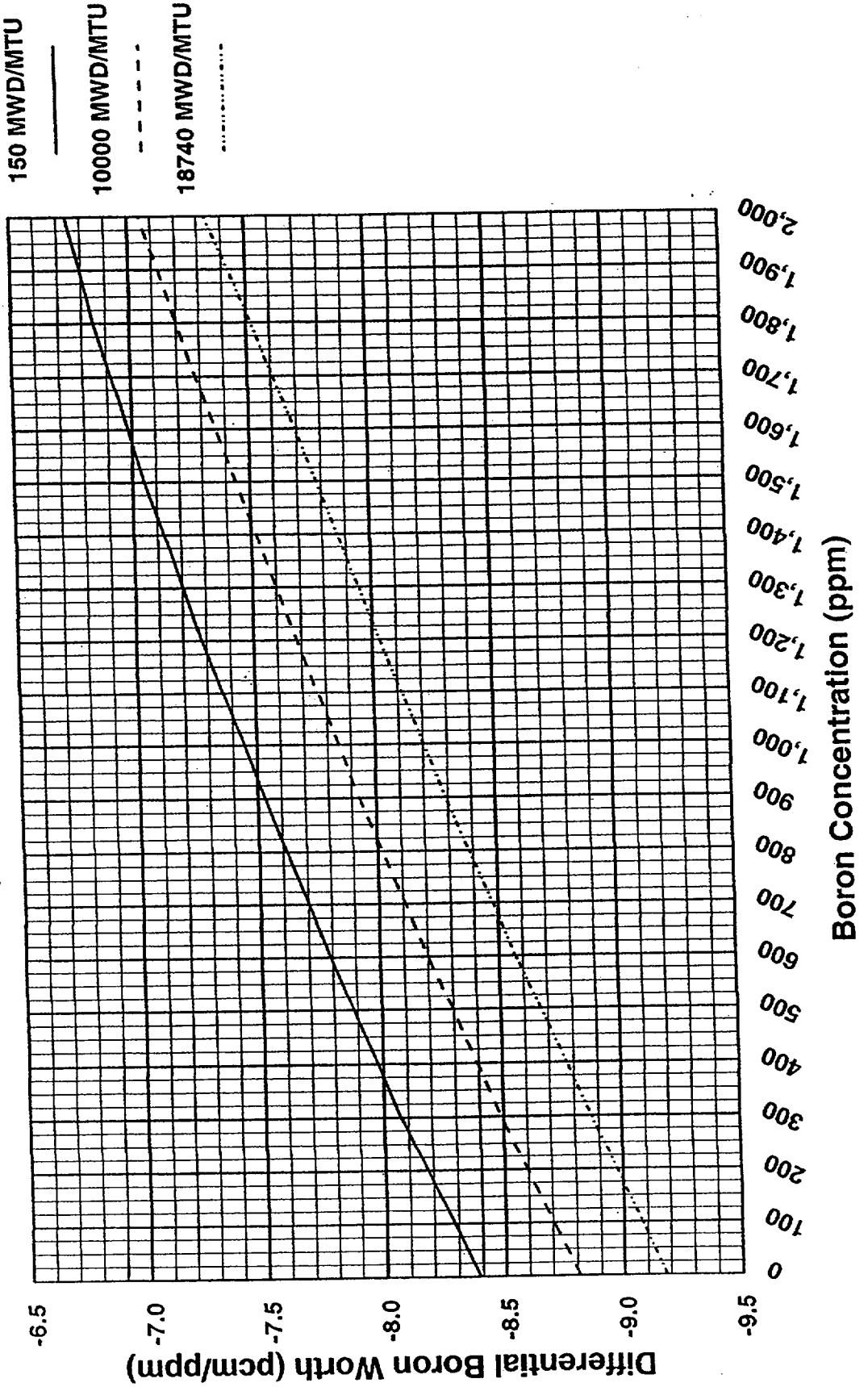
10 CFR Part 55 Content: 55.41 X
55.43

Comments:

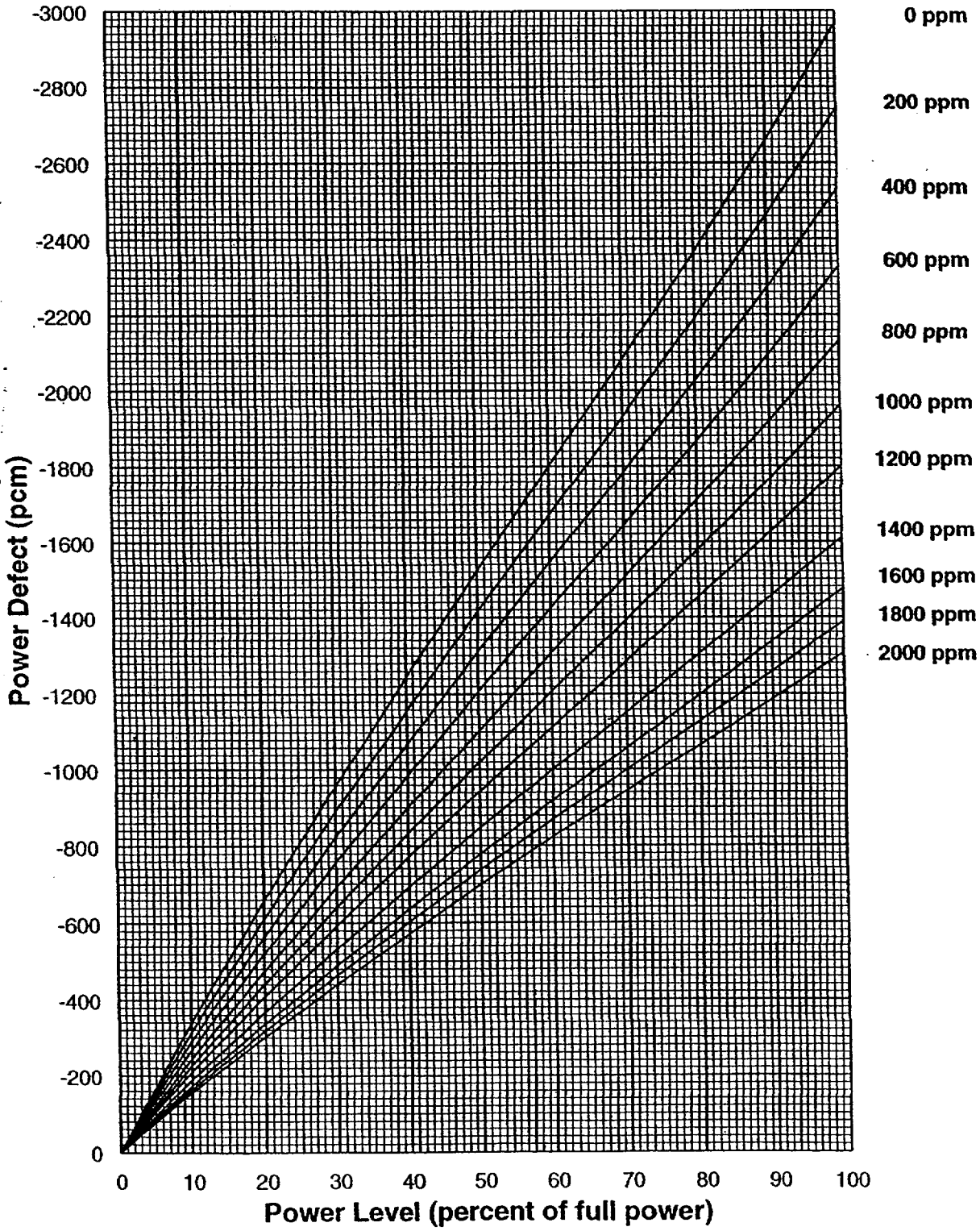
CB-20

Record Type # A9.345D

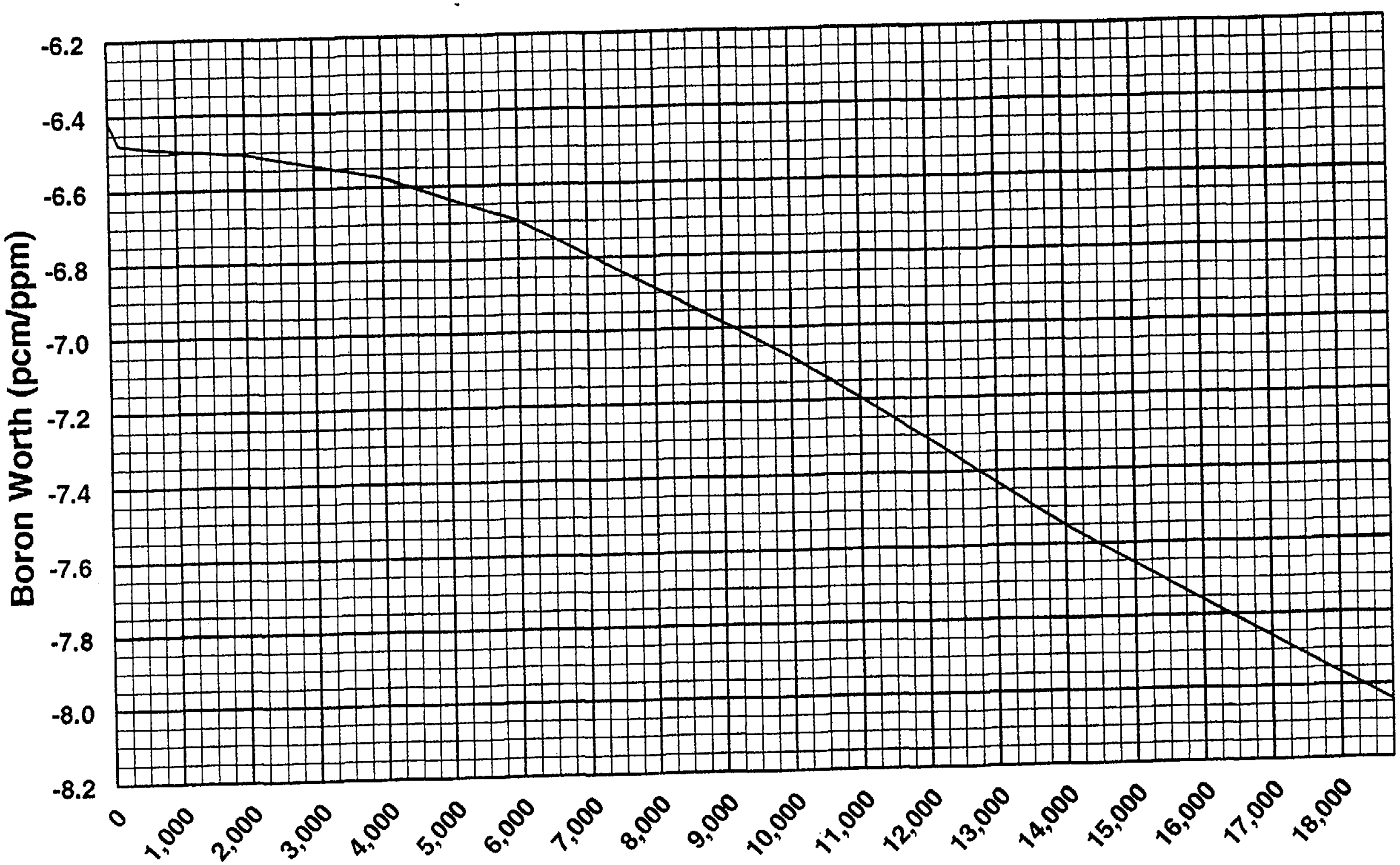
HZP Differential Boron Worth vs Boron Concentration Unit 1, Cycle 15



POWER DEFECT vs PERCENT POWER at BOL, MOL, and EOL Unit 1, Cycle 15



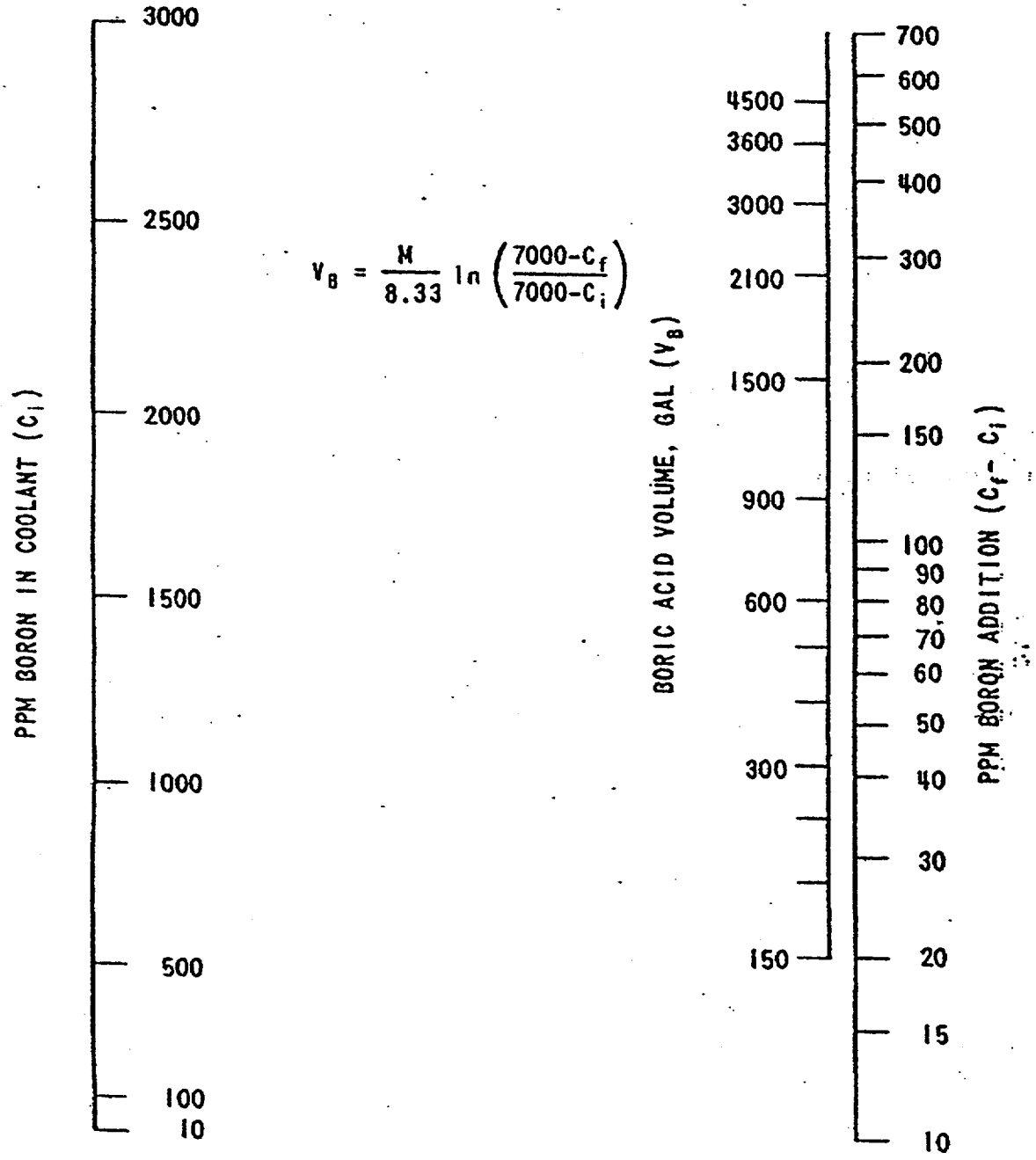
Boron Worth vs Burnup
ARO, HFP, Critical Boron
Unit 1, Cycle 15



Issue 15 Rev 1

CB-31

Record Type #9A.345D

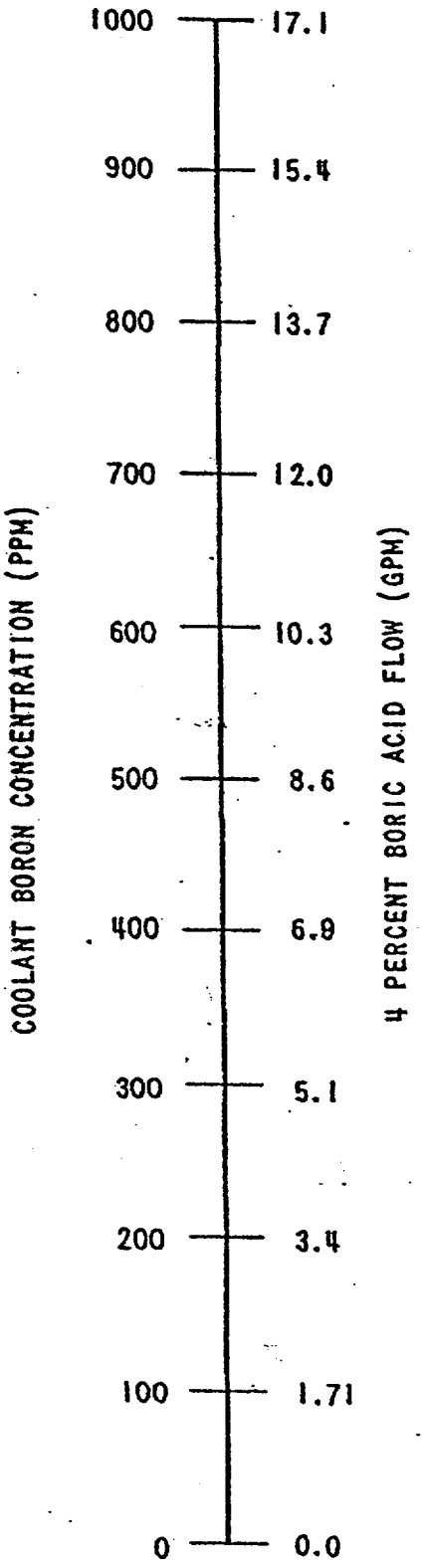


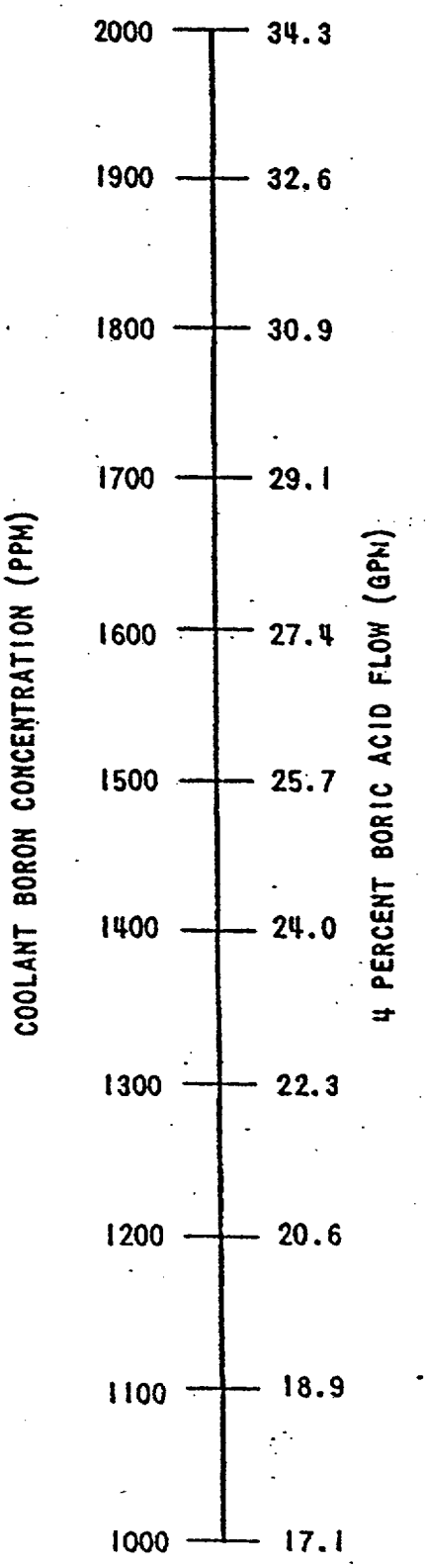
BORON ADDITION

(refer to figure CB-36 for correction factors)

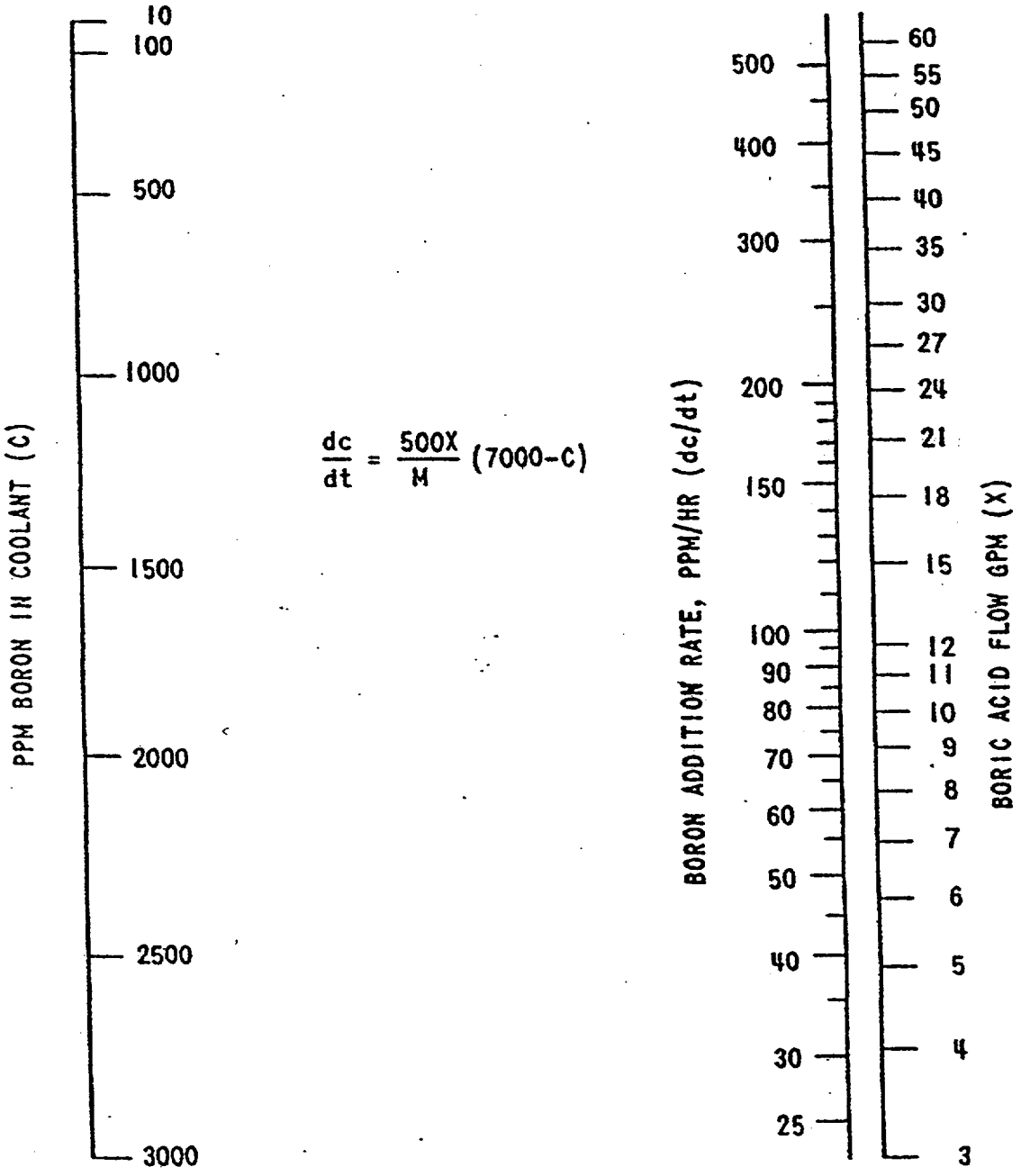
CB-30

Record Type #9A.345D



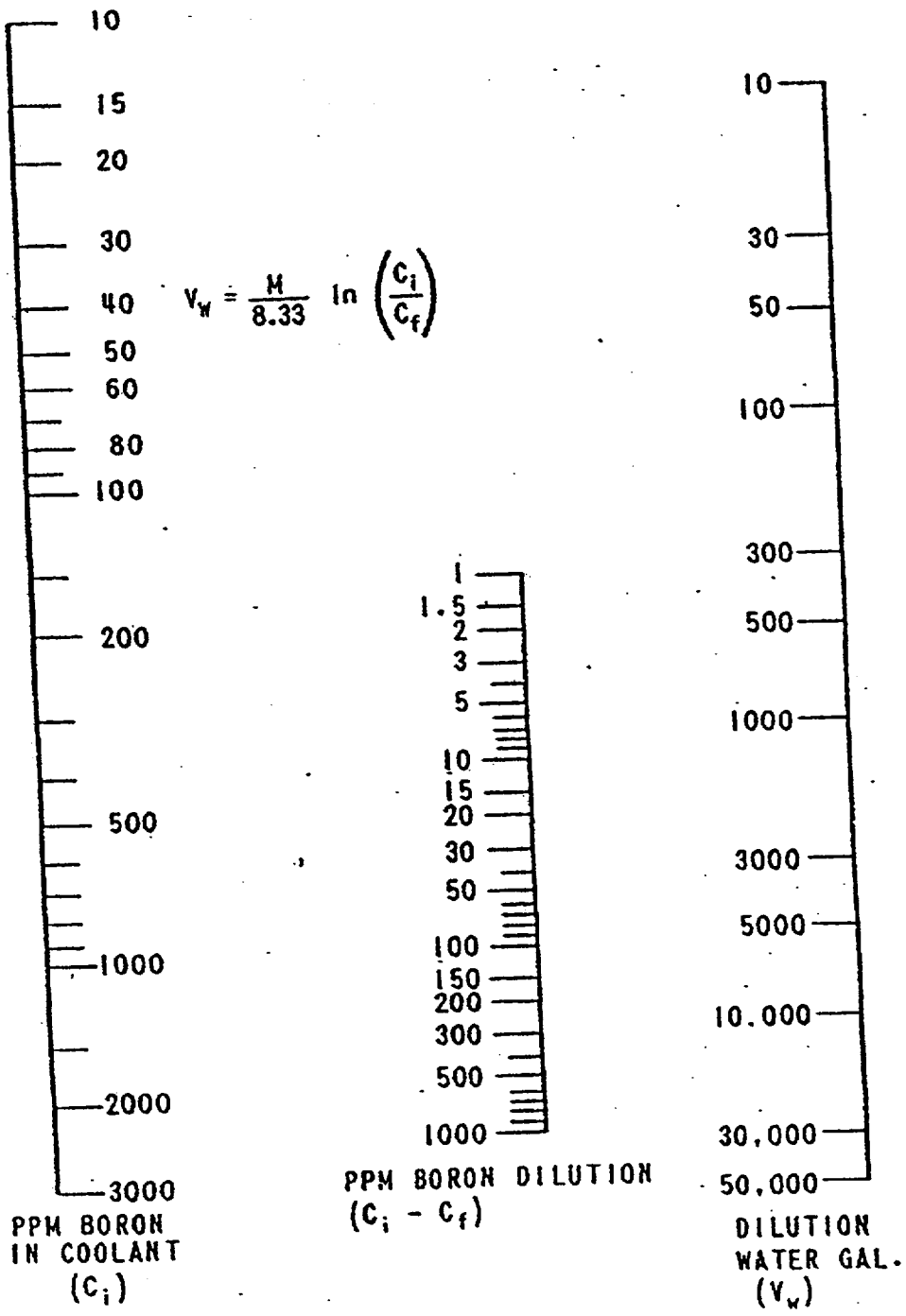


BLENDED FLOW BASED ON 120 GPM AUTO MAKEUP



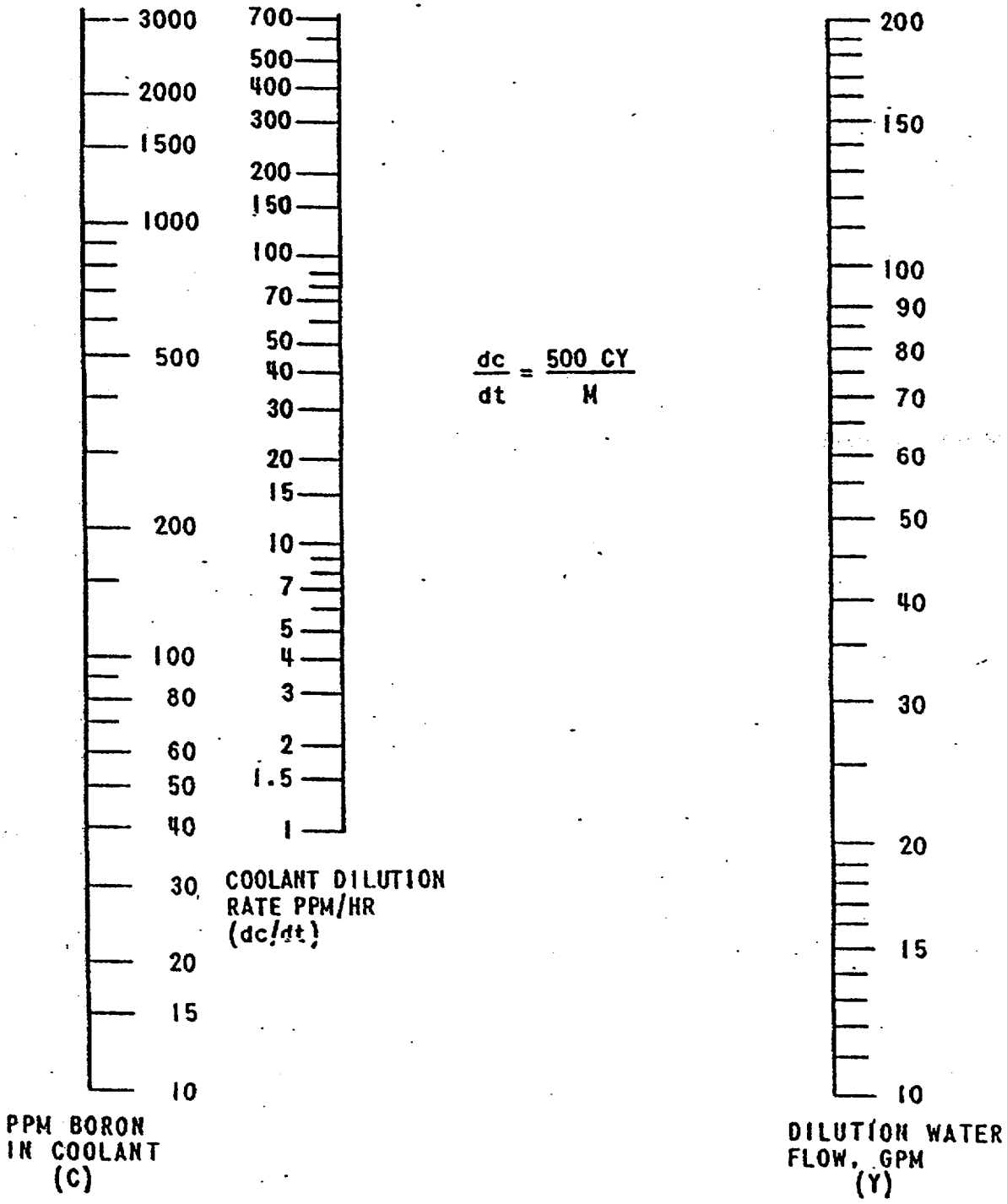
BORON ADDITION RATE

(refer to figure CB-36 for correction factors)



BORON DILUTION

(refer to figure CB-36 for correction factors)



BORON DILUTION RATE

(refer to figure CB-36 for correction factors)

NOMOGRAPH CORRECTION FACTORS

Plant Conditions			Correction Factor (K) (See Note)
Pressure (psig)	T (AVG) (°F)	Pressurizer Level	
2235	547-570	Normal Operating	1.00
1600	500	No-Load	1.05
1200	450	No-Load	1.10
800	400	No-Load	1.16
400	350	No-Load	1.18
400	300	No-Load	1.20
400	300	Solid Water	1.35
400	200	No-Load	1.28
400	200	Solid Water	1.40
400	100	Solid Water	1.47

NOTE: CORRECTION FACTORS ARE APPLIED AS FOLLOWS:

(a) Boron Addition and Dilution Total Volume Nomographs

$$V_{(Corrected)} = K \times V_{(Nomograph)}$$

(b) Boron Addition and Dilution Rate Nomographs

$$\frac{dc}{dt}_{(Corrected)} = \frac{1}{K} \times \frac{dc}{dt}_{(Nomograph)}$$

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.2.1	
	Importance Rating	3.7	3.6

Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

Proposed Question: Common 37

Given the following conditions:

- A reactor startup is in progress.
- Control Bank "A" withdrawal is in progress.
- The last two 1/M plots indicate that criticality will be achieved on Control Bank "B" at approximately 100 steps.
- Estimated Critical Position is Control Bank "C" at 144 steps.

Which one of the following actions is required for these conditions?

A. Trip the reactor and initiate Emergency Boration.

B. Stop the startup and determine whether criticality will be within 500 pcm of the ECP prior to proceeding.

C. Insert all Control Banks to zero steps, verify Shutdown Margin and recalculate the ECP.

D. Continue the startup to obtain one additional 1/M data point to validate the accuracy of the plot.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Required if critical below RIL.
B. Incorrect. Criticality apparent below RIL.
C. Correct.
D. Incorrect. Would not proceed with CB withdrawal if 2 consecutive plots show criticality below RIL.

Technical Reference(s): 1OM-50.2.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.2.33	
	Importance Rating	2.5	2.9

Knowledge of control rod programming.

Proposed Question: Common 38

Given the following conditions:

- The Control Rod full out position is 230 steps.
- The required bank overlap for the current fuel cycle is 102 steps.

During rod withdrawal, when Control Bank "B" reaches full out position, what will be the position of Control Bank "C"?

A. 000 steps

B. 102 steps

C. 128 steps

D. 230 steps

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Bank D would still be 0 steps, but Bank "C" will withdraw when Bank "B" reaches 128 steps.
B. Correct. Bank "C" will begin withdrawal at "B" = 128 steps.
C. Incorrect. Assumes withdrawal starts at 102 steps on "B".
D. Incorrect. Would have to assume Bank "C" is withdrawn before "B".

Technical Reference(s): 1OM Figure 1.16 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3 Objective 16 (As available)

Question Source: Bank #
Modified Bank # 1LOT4 RO/SRO #93 (Note changes or attach parent)
New

Question History: 1LOT4 RO/SRO #93

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		2.3.11	
	Importance Rating	2.7	3.2

Ability to control radiation releases

Proposed Question: Common 39

Given the following conditions:

- A rapid load reduction from 100% power to 65% power was performed approximately 3 hours ago.
- [RM-1CH-101B], Reactor Coolant Letdown Low Range Monitor is in alarm.
- [RM-1CH-101A], Reactor Coolant Letdown High Range Monitor has just reached its alarm setpoint.
- Actions of 1OM-43.4.AAC, Radiation Monitoring HIGH-HIGH have been completed.
- Chemistry confirms RCS activity exceeds TS 3.4.8 limits.

The Unit Supervisor directs a Unit shutdown be performed.

Which one of the following actions is designed to limit the release of radioactivity in the event of a subsequent SGTR?

A. MSIVs are closed.

B. SG Atmospheric Dump valve setpoints are raised.

C. RCS is cooled down below 500°F.

D. Maximum Condensate Polishers are placed in service.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Closing MSIVs would contribute to rad release through SG ADVs and Safeties if cooldown and depressurization was not performed in a timely manner.
B. Incorrect. ADV setpoints are normally raised in SGTR procedure, but operated manually at BVPS-1.
C. Correct.
D. Incorrect. Condensate polishing would help clean the secondary plant but not an action

performed in accordance with the ARPs.

Technical Reference(s): TS 3.4.8 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-43.1 Objectives 9 and 10 (As available)

Question Source: Bank #
Modified Bank # (Vendor Bank. Previous NRC) (Note changes or attach parent)
New

Question History: (Vendor Bank. Previous NRC)

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.3.9	
	Importance Rating	2.5	3.4

Knowledge of the process for performing a Containment Purge

Proposed Question: Common 40

The Unit is in Mode 5. Preparations are being made to enter Containment.

Which one of the following describes the correct sequence for initiating a Containment Purge to the Ventilation Vent?

A. Open Supply and Exhaust dampers, start [1VS-F-5], CNMT Purge Exhaust Fan. If desired, start [1VS-HV-5], CNMT Purge Vent Sup Fan, after ensuring the NORMAL/REFUELING control switch is in the NORMAL position.

B. Open Supply and Exhaust dampers, start [1VS-F-5], CNMT Purge Exhaust Fan. If desired, start [1VS-HV-5], CNMT Purge Vent Sup Fan, after ensuring the NORMAL/REFUELING control switch is in the REFUELING position.

C. Start [1VS-F-5], CNMT Purge Exhaust Fan. Ensure the Supply and Exhaust dampers open. Place the NORMAL/REFUELING control switch is in the NORMAL position, and start [1VS-HV-5], CNMT Purge Vent Sup Fan.

D. Start [1VS-F-5], CNMT Purge Exhaust Fan. Ensure the Supply and Exhaust dampers open. Place the NORMAL/REFUELING control switch is in the REFUELING position, and start [1VS-HV-5], CNMT Purge Vent Sup Fan.

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. Switch should be placed in NORMAL.
C. Incorrect. Wrong sequence and dampers are manually aligned.
D. Incorrect. Wrong sequence, wrong switch position and dampers are manually aligned.

Technical Reference(s): 1OM-44C.4.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-44.C.1 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.3.1	
	Importance Rating	2.6	3.0

Knowledge of 10CFR20 and related facility radiation control requirements

Proposed Question: Common 41

Who, by title, can authorize a person to receive a radiation dose in excess of the Beaver Valley Administrative TEDE limits?

A. Site Senior Vice President

B. Plant General Manager

C. Superintendent, Operations

D. Manager, Health Physics

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Authorizes Planned Special Exposures.
B. Correct.
C. Incorrect. Serves on ALARA committee or establishes other ALARA support.
D. Incorrect. Authorizes Planned Special Exposures and enforces ALARA policies.

Technical Reference(s): 1/2 ADM - 1631 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 08-01-801 Objective 29 (As available)

Question Source: Bank # X
Modified Bank # ____ (Note changes or attach parent)
New ____

Question History: 1LOT4 SRO exam #24

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	001AK1.23	
	Importance Rating	2.6	2.9

Knowledge of the operational implications of the following concepts as they apply to continuous Rod Withdrawal: Calculation of power defect: algebraic sum of moderator temperature and fuel temperature defects.

Proposed Question: Common 42

The Unit is at 97% power. All systems are in NSA.

The RO withdraws control rods 2 steps for Tavg control. When the In-Hold-Out switch is released, rod motion continues.

The following alarms are received:

- [A4-46], Tavg Deviation from Tref
- [A4-51], Loop Tavg High

The rod motion stops prior to any operator action occurring.

Which one of the following describes an INITIAL reactivity effect of the rod motion?

A. The positive reactivity added by FTC and MTC result in a higher total power defect.

B. The negative reactivity added by FTC and MTC result in a higher total power defect.

C. The positive reactivity added by FTC and MTC result in a lower total power defect.

D. The positive reactivity added by FTC and MTC result in a higher total power defect.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. As rods withdraw, adding positive reactivity, Tavg rises. With MTC and FTC at negative values, it results in negative reactivity being added, which will add to the total negative value of power defect.

B. Correct.

C. Incorrect. Negative reactivity is added by MTC and FTC.

D. Incorrect. Negative reactivity is added by MTC and FTC.

Technical Reference(s): Plant curves 5A,5B,5C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: GFE - Operational Physics (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	003AA2.04	
	Importance Rating	3.4	3.6

Ability to determine and interpret the following as they apply to the Dropped Control Rod: Rod motion stops due to dropped rod.

Proposed Question: Common 43

Given the following conditions:

The Unit is at 100% power with all systems in NSA.

- [A4-97], ROD CONTROL SYSTEM NON-URGENT ALARM illuminates.
- [A4-126], ROD BOTTOM ROD DROP is illuminated.
- One Control Bank "D" rod is indicating '0' steps.
- The RO places Rod Control in MANUAL.
- Other Control Room annunciators illuminate as expected for plant conditions.
- Reactor power indicates as follows:
  - N41 - 100.1%
  - N42 – 103.3%
  - N43 – 100.1%
  - N44 – 94.7%

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

A. The Rod Control System Non-Urgent condition must be cleared.

B. The 'Loop OP Delta-T Auto Turbine Runback Block Auto Rod Withdrawal' circuitry must be reset.

C. The 'NIS Power Range High Setpoint Overpower Rod Stop Block Auto Rod W/D' must be cleared.

D. The 'Power Range Channel Deviation' must be cleared at the NIS Comparator and Rate Drawer.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Non-Urgent failures will not inhibit rod motion.
B. Incorrect. Two channels required for the runback and rod stop.
C. Correct. One PR channel exceeds 103%.
D. Incorrect. There will be a Power Range Deviation alarm, but it will not prevent rod motion.

Technical Reference(s): 1OM-2.4 Alarm A4-66 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3 Objective 18 and 23.e (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	005AA2.03	
	Importance Rating	3.5	4.4

Ability to determine and interpret the following as they apply to the inoperable / Stuck Control Rod: Required actions if more than one rod is stuck or inoperable.

Proposed Question: Common 44

Given the following conditions:

A load rejection has occurred from 100% power. The Unit has stabilized at 82% power.

- The RO determines that 2 Control Bank "D" rods did not move during the load rejection.
- The rods are approximately 16 steps above the remainder of Control Bank D.
- The Urgent Failure and Non-Urgent Failure alarms are NOT lit.

Which one of the following describes the required action for this condition?

A. Initiate a boration to increase Shutdown Margin by an amount equal to the stuck rod worth, and align the remainder of Control Bank "D" rods with the stuck rods.

B. Initiate boration to increase Shutdown Margin by an amount equal to the stuck rod worth, and commence a plant shutdown to Mode 3.

C. Trip the reactor and commence boration to achieve adequate Shutdown Margin in accordance with ES-0.1, Reactor Trip Response.

D. Trip the reactor and commence emergency boration in accordance with FR-S.1, Response to Nuclear Power Generation/ATWS.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Would not withdraw remainder of Bank "D" to match stuck rods, although action in the AOP for misaligned rods lower than the bank would require realignment.

B. Correct.

C. Incorrect. Trip conditions do not exist. If 2 rods were dropped, then a trip would be

required.

D. Incorrect. Reactor trip not required, would not use FR-S.1 to borate.

Technical Reference(s): AOP-1.1.8 step 4 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3, Objective 23.e and 25 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	011EK2.02	
	Importance Rating	2.6	2.7

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

Proposed Question: Common 45

The Unit is at 60% power.

- [1SI-P-1A], LHSI Pump "A" is out of service. Expected to return to service in 3 hours.
- [1QS-P-1A], Quench Spray Pump "A" is out of service. Expected to return to service in 6 hours.

A large break LOCA occurs. The crew takes action in accordance with E-1, Loss of Reactor or Secondary Coolant.

The following conditions currently exist:

- Containment pressure 32 psig, DECREASING slowly
- RCS pressure 100 psig, STABLE
- Pressurizer level Off-Scale LOW

All actuations have occurred as required.

If the RWST was at its minimum level for operability when the event occurred, approximately how much time will pass before transition to ES-1.3, Transfer to Cold Leg Recirculation, is required?

A. One hour

B. Two hours

C. Three hours

D. Four hours

Proposed Answer: A

Explanation (Optional):

A. Correct. One train of LHSI will deliver 3000 GPM. One train of QSS will deliver 2500

GPM. 2 trains of HHSI will deliver approximately 1000 GPM. TS minimum is approximately 440,000 gallons (50 ft). Swapover is at approximately 170,000 gallons (19 ft).

B. Incorrect.

C. Incorrect.

D. Incorrect.

Distractors placed for symmetrical time periods.

Technical Reference(s): Tank Curves QS-TK-1 (Attach if not previously provided)
1OM11.1.C, 1OM13.1.C
TS section 3.4, E-1 CA summary

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-11.1 Objective 16 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	015/017AA2.11	
	Importance Rating	3.4	3.8

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): When to jog RCPs during ICC

Proposed Question: Common 46

Which one of the following describes the operation of RCP's during the performance of FR-C.1, Response to Inadequate Core Cooling?

A. If RCPs are available, they are started early in the event to provide forced flow ONLY if seal injection and CCR are available.

B. If RCPs are available, they are started early in the event to provide forced flow EVEN IF seal injection and CCR are NOT available.

C. At least 1 RCP is started to provide forced flow and mixing of RCS water after secondary depressurization has resulted in SI Accumulator Injection.

D. At least 1 RCP is started to provide forced flow of the RCS when secondary depressurization is ineffective in restoring adequate core cooling.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. RCPs will not be running for this event, but they will be started later if other methods to restore core cooling have failed, regardless of support system status.
B. Incorrect. RCPs will be started later in the event if other methods are ineffective.
C. Incorrect. If secondary depressurization restores core cooling via accumulator injection, RCP operation is unnecessary.
D. Correct.

Technical Reference(s): FR-C.1 Background pg 3, 48, 50, 51 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.2, Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	024AA1.07	
	Importance Rating	3.3	3.4

Ability to operate and/or monitor the following as they apply to the Emergency Boration: BWST level.

Proposed Question: Common 47

Given the following conditions:

- An ATWS has occurred.
- The crew is performing the actions of FR-S.1, Response to Nuclear Power Generation/ATWS.
- The RO has initiated emergency boration.
- All equipment has operated as designed.
- SI is NOT actuated.
- RCS pressure is 2210 psig and trending DOWN.
- Tavg is 567°F and trending DOWN.

Which one of the following describes plant response to initiation of the boration?

A. Boric Acid Tank level will be dropping at a rate approximately equal to charging flow.

B. Volume Control Tank level will be dropping at a rate approximately equal to charging flow.

C. Refueling Water Storage Tank level will be dropping at a rate approximately equal to charging flow.

D. Pressurizer level will be rising at a level approximately equal to charging flow.

Proposed Answer: A

Explanation (Optional):

A. Correct. BAT will be supplying borated water if everything works properly.
B. Incorrect. VCT level may actually be rising because there is no outflow, and Letdown may still be flowing.
C. Incorrect. RWST not supplying any water unless equipment does not work properly or

SI is initiated.

D. Incorrect. In a transient like an ATWS, pressurizer level will also be in a transient state, due to RCS mass changing from temperature changing.

Technical Reference(s): FR-S.1 Step 7 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53.3 Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	026AA1.01	
	Importance Rating	3.1	3.1

Ability to operate and/or monitor the following as they apply to the Loss of Component Cooling Water: CCW/nuclear service water temperature indications.

Proposed Question: Common 48

Given the following conditions:

- The Unit is in Mode 5.
- [1CC-E-1A], CCR Heat Exchanger "1A", is in service.
- [TCV-1CC-100], CCR Temperature Control Valve is in MANUAL.
- The operating CCR pump trips on overcurrent.

Prior to any action by the crew, which one of the following describes system temperature response at the outlet of [1CC-E-1A] over the next 10 seconds?

A. River Water temperature will RISE
CCR temperature will RISE

B. River Water temperature will DROP
CCR temperature will DROP

C. River Water temperature will RISE
CCR temperature will DROP

D. River Water temperature will DROP
CCR temperature will RISE

Proposed Answer: B

Explanation (Optional):

A. Incorrect. When the CCR pump trips, flow in the CCR loop will drop. Heat will not be removed from RHR, so heat load in the system is temporarily reduced. The reduced flow will cause water in the heat exchanger to be cooled for a longer period by RW.

B. Correct.

C. Incorrect. RW continues to flow. Removing less heat will reduce the HX outlet temperature.

D. Incorrect. Less CCR flow against the same RW flow will drop temperature.

Technical Reference(s): 1OM15.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-15.1 Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	029EK2.06	
	Importance Rating	2.9	3.1

Knowledge of the interrelations between the ATWS and the following: Breakers, relays and disconnects.

Proposed Question: Common 49

Given the following conditions:

- Reactor Trip testing is in progress on Train "A".
- Reactor Trip Breaker "A" is open.
- Reactor Trip Bypass Breaker "A" is closed.
- A transient occurs requiring a reactor trip.
- The RO attempts to manually trip the reactor but the reactor does NOT trip.

Which one of the following describes a failure that has contributed to the reactor trip failure?

A. Reactor Trip Breaker "B" Trip relays failed to energize.

B. Reactor Trip Breaker "B" Shunt Trip relays failed to deenergize.

C. Reactor Trip Bypass Breaker "A" Trip relays failed to deenergize.

D. Reactor trip Bypass Breaker "B" Shunt Trip relays failed to energize.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. RTB "B" trip relays are normally energized. Deenergizes on trip signal.
B. Incorrect. Shunt trip energizes to trip the RTB.
C. Correct. RTB "B" trip relays act the same as RTB trip coils.
D. Incorrect. RTB "B" not equipped with a shunt trip.

Technical Reference(s): 1OM-1.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 2, 10, 11 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	067AA1.06	
	Importance Rating	3.5	3.7

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

Proposed Question: Common 52

Which one of the following fire alarms can be verified by checking that Annunciator [A11-123], MOTOR DRIVEN FIRE PUMP RUNNING, is lit?

A. [A8-6], Main Transformer

B. [A11-67], Cable Tray Mezzanine

C. [A11-65], Diesel Generator Building "A"

D. [A11-70], Turbine Generator Bearings and Enclosure

Proposed Answer: A

Explanation (Optional):

A. Correct. Main Transformer is a Water Spray Protected Area. When the HAD initiates water spray for the Main Transformer, the Motor Driven Fire Pump automatically starts on low fire main pressure.
B. Incorrect. CO_2 protected area.
C. Incorrect. CO_2 protected area.
D. Incorrect. CO_2 protected area.

Technical Reference(s): 1OM-33.4.AAA (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-33.1 Objective 11 (As available)

Question Source: Bank # ____
Modified Bank # ____ (Note changes or attach parent)
New X

Question History:

Question Cognitive Level:	Memory or Fundamental Knowledge		
	Comprehension or Analysis		Comp
10 CFR Part 55 Content:	55.41	X	
	55.43		

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
		068AA1.16	
	Importance Rating	3.2	3.3

Ability to operate and/or monitor the following as they apply to the Control Room Evacuation: Turbine throttle valve indicating lights and position indicators.

Proposed Question: Common 53

Given the following conditions:

- A small fire has developed in the Control Room.
- The Shift Manager has determined that Control Room evacuation is required.
- A manual reactor trip has been initiated, and all control rods have been verified fully inserted.

Which one of the following describes the minimum additional action required to verify Turbine Trip?

A. Verify turbine throttle valves all closed or verify governor valves all closed prior to exiting the control room.

B. Verify turbine throttle valves all closed and verify governor valves all closed prior to exiting the control room.

C. Verify turbine throttle valves all closed or verify governor valves all closed in the Turbine Building prior to manning the Emergency Shutdown Panel.

D. Verify turbine throttle valves all closed and verify governor valves all closed in the Turbine Building prior to manning the Emergency Shutdown Panel.

Proposed Answer: A

Explanation (Optional):

A. Correct. In accordance with AOP-1.33.1A, Control Room Inaccessibility, the turbine trip is verified prior to leaving the control room by checking throttle valves all closed OR governor valves all closed.
B. Incorrect. Only required to check one or the other.
C. Incorrect. Checked in control room.
D. Incorrect. Checked in control room, and only one set of valves required.

Technical Reference(s): AOP-1.33.1A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1/2SQS-53C.1 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
		074EA2.08	
	Importance Rating	3.8	4.6

Ability to determine or interpret the following as they apply to Inadequate Core Cooling: The effects of turbine bypass valve operation on RCS temperature and pressure.

Proposed Question: Common 54

Given the following conditions:

- The Unit was operating at 100% power.
- Reactor trip occurred due to a LOCA.
- All safety injection systems failed to operate.
- FR-C.1, Response To Inadequate Core Cooling, has been entered.
    - The Unit Supervisor has directed the depressurization of all intact steam generators to 150 psig using the condenser steam dumps.
    - All MSIVs are open and the condenser is available.
    - The steam dump controller (AM-1MS-464B) is in manual.
    - The steam dump control mode selector switch is in the STM PRESS position, and steam generator depressurization is underway.
    - PRZR pressure is > 1950 psig, and the Block Steamline SI Switches have NOT been placed in the BLOCK position.
    - As the steam generator depressurization progresses, the steam flow automatically stops.

Which one of the following has caused the steam flow to stop?

A. Steam generator pressure has reached 150 psig or Main Steamline Isolation due to exceeding the high steam pressure rate setpoint.

B. Steam header pressure has dropped below the setpoint on [AM-1MS-464B] or Tavg is below 541°F and no action has been taken to defeat the Tavg Interlock.

C. Tavg is below 541°F and no action has been taken to defeat the Tavg Interlock or Main Steamline Isolation due to exceeding the high steam pressure rate setpoint.

D. Main Steamline Isolation due to exceeding the high steam pressure rate setpoint or Steam header pressure has dropped below the setpoint on [AM-1MS-464B].

Proposed Answer: C

Explanation (Optional):

A. Incorrect. No automatic actions halt steam dump at 150 psig.
B. Incorrect. AM-1MS-464B is in manual. Pressure setpoint has no effect.
C. Correct. As Tavg approaches 541°F, the Tavg Interlock must be defeated by holding both steam dump control bypass interlock selector switches to the DEFEAT TAVG NTLK position until the status light, "2/3 Lo-Lo Tavg" is LIT. This action was not performed. Also, the Main Steamline Isolation due to exceeding the high steam pressure rate setpoint is active and could have resulted in an MSIV isolation if the rate of depressurization was excessive.
D. Incorrect. AM-1MS-464B is in manual. Pressure setpoint has no effect.

Technical Reference(s): FR-C.1 Step 16 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	E01EK1.3	
	Importance Rating	3.1	3.5

Knowledge of the operational implications of the following concepts as they apply to the (Reactor Trip or Safety Injection/Rediagnosis): Annunciators and conditions indicating signals and remedial actions associated with the (Reactor Trip or Safety Injection/Rediagnosis).

Proposed Question: Common 55

Given the following conditions:

- A Reactor Trip and Safety Injection have occurred.
- The crew was performing action contained in E-1, Loss Of Reactor or Secondary Coolant.
- The Unit Supervisor was concerned about conflicting indications, and the crew entered ES-0.0, Rediagnosis.
- The crew determines that there is an increasing trend on [RM-1MS-101], FW-P-2 Monitor and [RM-1MS-100A], Steam Relief Monitor.

Which one of the following describes how the crew will transition to the correct procedure?

A. Go directly to the appropriate E-3 or ECA-3 series procedure.

B. Return to E-0 diagnostic steps to verify indications that will confirm the event in progress.

C. Return to E-1 step in effect and use the Symptomatic Response/Unexpected Conditions page to direct entry to E-3.

D. Direct Chemistry sample of steam generators to confirm radiation monitor readings prior to making a determination of appropriate procedure entry.

Proposed Answer: A

Explanation (Optional):

A. Correct. ES-0.0 Step 3.
B. Incorrect. Once in ES-0.0, transition back to E-0 will not be made.
C. Incorrect. Once E-1 is exited, ES-0.0 will direct entry to the appropriate procedure.
D. Incorrect. Procedure is entered without the need of a confirmatory sample.

Technical Reference(s): ES-0.0, Step 3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	E02EK1.3	
	Importance Rating	3.5	3.8

Knowledge of the operational implications of the following concepts as they apply to the (SI Termination): Annunciators and conditions indicating signals and remedial actions associated with the (SI Termination).

Proposed Question: Common 56

Given the following conditions:

- A Steam Line Break has occurred.
- All equipment actuated as required.
- The crew has isolated the faulted steam generator.
- The Unit Supervisor has directed transition to ES-1.1, SI Termination.
- SI, CIA, and CIB have been reset.
- RCS pressure is 1775 psig and rising slowly.
- There are NO other indications of RCS leakage.

Which one of the following describes the sequence of steps that will stop the SI pumps?

A. Stop 1 HHSI pump
Check RCS pressure stable and align normal Charging
Stop BOTH LHSI pumps

B. Stop 1 HHSI pump
Check RCS pressure stable and align normal Charging
Stop 1 LHSI pump. Ensure RCS pressure remains stable, then stop the second LHSI pump

C. Align normal Charging
Check RCS pressure stable and stop 1 HHSI pump
Stop BOTH LHSI pumps

D. Align normal Charging
Check RCS pressure stable and stop 1 HHSI pump
Stop 1 LHSI pump. Ensure RCS pressure remains stable, then stop the second LHSI pump

Proposed Answer: A

Explanation (Optional):

A. Correct. HHSI stopped first because termination criteria is met and do not want to overfill pressurizer. With RCS pressure greater than 1700 psig, there is no LHSI flow, and stopping both pumps is required.

B. Incorrect. Pressure will not change after stopping 1 LHSI pump with RCS pressure >250 psig. There is no LHSI flow to change RCS parameters.

C. Incorrect. Do not align normal charging until after it is determined that RCS pressure is stable with only 1 charging pump in operation.

D. Incorrect. Do not align normal charging until after it is determined that RCS pressure is stable with only 1 charging.

Technical Reference(s): ES-1.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X

55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		007EA2.04	
	Importance Rating	4.6	4.4

Ability to determine or interpret the following as they apply to a reactor trip: If reactor should have tripped but has not done so, manually trip the reactor and carry out actions in ATWS EOP.

Proposed Question: Common 58

The Unit is operating at 100% power when the following conditions occur:

- A PRZR spray valve sticks open and PRZR pressure has lowered to 1800 psig.
- Reactor Trip Breakers are SHUT.
- Neutron flux is NOT dropping.

Which one of the following describes an Immediate Manual Action?

A. Verify AFW status.

B. Verify MSL Isolation.

C. Isolate Condenser Steam Dump Valves.

D. Initiate Emergency Boration of the RCS.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Performed after Immediate Actions are complete.
B. Incorrect. Performed after Immediate Actions are complete.
C. Correct. Operator Immediate Action is to place both Steam Dump Control Interlock Selector Switches in the OFF position to isolate the condenser steam dump valves.
D. Incorrect. Performed after Immediate Actions are complete.

Technical Reference(s): FR-S.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		008AA2.20	
	Importance Rating	3.4	3.6

Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: The effect of an open PORV on code safety, based on observation of plant parameters.

Proposed Question: Common 59

With the Unit operating at 100% power, the reactor trips on low Pressurizer pressure.

Pressurizer Relief Tank pressure indicates 15 psig on PI-1RC-472. The crew suspects that a PORV opened inadvertently and is now stuck partially open.

Which one of the following confirming indications could be expected if a PORV is stuck partially open?

A. PORV relief line temperature stabilized at 213°F. PRZR Safety relief line temperatures indicate 180°F and very slowly rising.

B. PORV relief line temperature stabilized at 250°F. PRZR Safety relief line temperatures indicate 217°F and very slowly rising.

C. PORV relief line temperature stabilized at 213°F. PRZR Safety relief line temperatures indicate 110°F and stable.

D. PORV relief line temperature stabilized at 250°F. PRZR Safety relief line temperatures indicate 110°F and stable.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. 213°F is the saturation temperature corresponding to 15 psia.
B. Correct. 250°F is the saturation temperature corresponding to 30 psia (15 psig PRT pressure = 30 psia). Safety relief line temperatures would be rising because they share a common discharge line to the PRT with the PORVs.
C. Incorrect. 213°F is the saturation temperature corresponding to 15 psia. Also, safety relief line temperatures would be rising because they share a common discharge line to the PRT with the PORVs.
D. Incorrect. 250°F is the saturation temperature corresponding to 30 psia (15 psig PRT pressure = 30 psia); however, safety relief line temperatures would be rising because they share a common discharge line to the PRT with the PORVs.

Technical Reference(s): Steam Tables (Attach if not previously provided)
1OM6.4 Annunciator response

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

Learning Objective: 1SQS-6.4 Objectives 19/20 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	2
		027AA2.07	
	Importance Rating	3.1	3.1

Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunctions: Makeup flow indication.

Proposed Question: Common 60

Given the following conditions:

- The Unit is at 100% power, steady state. All systems are in NSA.
- Pressurizer level is on program and stable.
- Pressurizer pressure is 2235 psig and stable.
- Charging flow on [FI-1CH-122] indicates 70 GPM.

A malfunction results in the loss of Pressurizer heaters. When heaters are restored, the following conditions exist:

- Pressurizer level is on program and stable.
- Pressurizer pressure is 2000 psig.

Which one of the following describes the approximate value for charging flow indication on [FI-1CH-122]?

A. 0 GPM

B. 60 GPM

C. 70 GPM

D. 80 GPM

Proposed Answer: B

Explanation (Optional):

A. Incorrect. No flow would indicate that charging flow was lost or isolated. There is no condition present for charging flow to be isolated.

B. Correct. Slightly lower flow due to the slightly lower DP between the RCS and the VCT causing letdown flow to be less. The charging flow control valve will compensate to reduce makeup.

C. Incorrect. Charging flow will not remain constant if letdown flow changes.

D. Incorrect. Charging flow will not rise unless either RCS pressure rises or there is a leak in the RCS.

Technical Reference(s): Simulator Response (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-7.1 Objective 19 (As available)

Question Source: Bank #

Modified Bank # 1LOT4 NRC Exam #27 (Note changes or attach parent)

New

Question History: 1LOT4 NRC (Modified)

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X

55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		032AK3.01	
	Importance Rating	3.2	3.6

Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Startup termination on source-range loss.

Proposed Question: Common 61

Given the following conditions:

- A reactor startup is in progress.
- Both Intermediate Range channels indicate approximately 5 E^{-11} amps.
- Source Range channel N-31 fails downscale.

Which one of the following describes the required operator response and the reason for the response?

A. Suspend the reactor startup; with only one source range channel operable, the minimum required Source Range High Flux Trip protection is not met.

B. Continue the reactor startup; with only one source range channel operable; 48 hours is allowed to restore two channels to service.

C. Suspend the reactor startup; source range channels are not required to trip the reactor; however, the source range monitoring functions must be available.

D. Continue the reactor startup; the Intermediate Range Neutron Flux Trip and the Power Range Neutron Flux-Low Trip provide the necessary core protection.

Proposed Answer: A

Explanation (Optional):

A. Correct. When in Mode 2, below P-6, and performing a reactor startup, if one source range neutron flux channel becomes inoperable, operations involving positive reactivity addition must be immediately suspended. This precludes any power escalation. With only one source range channel operable, core protection is severely reduced.
B. Incorrect. Cannot continue to Mode 1 or go above P-6.
C. Incorrect. Source Range is required for Rx Trip.
D. Incorrect. May not continue, and PR High Flux Low Setpoint is not enabled.

Technical Reference(s): AOP-1.2.1a (Attach if not previously provided)
TS 3.4.3.1 Basis

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53C.1 Objective 7 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		009EA1.01	
	Importance Rating	4.4	4.3

Ability to operate and/or monitor the following as they apply to Small Break LOCA: RCS Pressure and Temperature

Proposed Question: Common 62

Given the following conditions:

- A Small Break LOCA has occurred.
- The crew is performing the actions of ES-1.2, Post LOCA Cooldown And Depressurization.
- Safety Injection pumps have been stopped.
- Normal charging is aligned.
- The crew is depressurizing the RCS using normal spray.

Which one of the following describes the strategy for the continuing depressurization?

A. Maximize subcooling to ensure continued RCP operation.

B. Minimize subcooling to reduce RCS break flow.

C. Maximize subcooling to prevent a challenge to the Core Cooling CSF.

D. Minimize subcooling to ensure pressurizer level remains above the lower limit to allow heater operation during the RCS cooldown.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. RCP operation is not required for this event, although desired.

B. Correct. Strategy is to depressurize and attempt to minimize subcooling so that break flow is reduced, due to the minimal makeup provided by charging pumps.

C. Incorrect. Core cooling should not be challenged on loss of subcooling at these temps and pressures (this point in the cooldown).

D. Incorrect. Heater operation may be required to reduce the rate of increase in pressurizer level, but is not the reason for minimizing subcooling.

Technical Reference(s): ES-1.2 Background (Attach if not previously provided)
ES-1.2 Step 23

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

Question Source: Bank # X(Vendor Bank)
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	037AK3.05	
	Importance Rating	3.7	4.0

Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak: Actions contained in procedures for radiation monitoring, RCS water inventory balance, S/G tube failure, and plant shutdown.

Proposed Question: Common 63

Given the following conditions:

The Unit is at 100% power. All systems are in NSA.

The following alarms are received in the Control Room:

- [RM-1SV-100], Condenser Air Ejector Vent High
- [RM-BD-101], High Capacity SG Blowdown High-High
- [RM-1MS-102A], N-16 Steam Generator "A" Leak Monitor High-High

[RM-BD-101] and [RM-1MS-102A] are stable at or near their alarm setpoints. [RM-1SV-100] is stable above the High alarm setpoint.

Which one of the following describes the significance of the alarm status listed above?

A. The two radiation monitors in High-High alarm provide the threshold for tripping the reactor and initiating Safety Injection.

B. The alarm status of the radiation monitors give an approximate value for RCS primary-to-secondary leak rate.

C. The rate of increase of any of the three radiation monitors provides the threshold for tripping the reactor and initiating safety injection.

D. The alarm status of the radiation monitors determines the course of action taken on the charging and letdown system to provide an accurate estimate of the leak rate.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The threshold is inability to maintain pressurizer level. With all radiation monitors at high or high-high, leak rate is only 75 GPD.

B. Correct.

C. Incorrect. Pressurizer level provides threshold. Rate of increase can indicate increase in leak size, but does not provide the actual action.

D. Incorrect. Charging and letdown are manipulated on pressurizer level response.

Technical Reference(s): AOP-1.6.4 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53C.1 Objective 7 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		038EA2.07	
	Importance Rating	4.4	4.8

Ability to determine or interpret the following as they apply to a SGTR: Plant conditions, from survey of Control Room indications

Proposed Question: Common 64

Given the following conditions:

- The Unit was operating at 100% power when a reactor trip occurred on low pressurizer pressure.
- A Steam Generator Tube Rupture was diagnosed and E-3, Steam Generator Tube Rupture was entered.
- E-3, Step No. 31, "Control RCS Pressure and Charging Flow to Minimize RCS-To-Secondary Leakage" is being performed (attached).

Given the following control room indications:

- SG "C" Blowdown Sample indicates high radiation.
- SG "C" NR level is 32% and dropping.
- Feed flow has been isolated to SG "C".
- SG "A" and "B" levels are slowly lowering.
- PRZR level is 63% and rising.

Which one of the following describes the appropriate operator action?

A. Depressurize RCS.

B. Lower charging flow.

C. Turn on PRZR heaters.

D. Depressurize RCS and lower charging flow.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. If ruptured SG level is rising with a lower PRZR level than exists, would depressurize RCS.
B. Incorrect. If PRZR level is greater than 75%, would lower charging.
C. Correct.
D. Incorrect. If ruptured SG level was rising, would perform both.

Technical Reference(s): E-3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: E-3, Step 31

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis App

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Number E-3	Title Steam Generator Tube Rupture	Issue 1C Revision 2

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

****

CAUTION

RCS and ruptured SGs pressures must be maintained less than the ruptured SGs atmospheric steam dump setpoint to prevent offsite releases.

****

NOTE

When letdown is in service, charging flow should be maintained greater than 30 GPM to ensure adequate letdown cooling and prevent letdown from flashing to steam.

31 Control RCS Pressure And Charging Flow To Minimize RCS-To-Secondary Leakage

a. Perform appropriate actions from table:

		RUPTURED SG NR LEVEL		
		RISING	DROPPING	OFFSCALE HIGH
PRZR LEVEL	LESS THAN 32% [50% ADVERSE CNMT]	• Raise charging flow • Depressurize RCS using Step 31.b	Raise charging flow	• Raise charging flow • Maintain RCS & ruptured SGs pressures equal
	BETWEEN 32% [50% ADVERSE CNMT] AND 50%	Depressurize RCS using Step 31.b	Turn ON PRZR heaters	Maintain RCS & ruptured SGs pressures equal
	BETWEEN 50% AND 75% [61% ADVERSE CNMT]	• Depressurize RCS using Step 31.b • Lower charging flow	Turn ON PRZR heaters	Maintain RCS & ruptured SGs pressures equal
	GREATER THAN 75% [61% ADVERSE CNMT]	Lower charging flow	Turn ON PRZR heaters	Maintain RCS & ruptured SGs pressures equal

(step continued next page)

SYMPTOMATIC RESPONSE/UNEXPECTED CONDITIONS

E-3 (Issue 1C, Revision 2)

1. SI REINITIATION CRITERIA

Manually operate SI pumps and align valves as necessary and GO TO ECA-3.1, "SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired", Step 1, if EITHER condition listed below occurs:

- On ICCM RCS subcooling based on core exit TCs - LESS THAN 46F [54F FOR ADVERSE CNMT] (If less, refer to Attachment 6-A)
- PRZR level - CANNOT BE MAINTAINED GREATER THAN 18% [37% FOR ADVERSE CNMT]

2. SECONDARY INTEGRITY CRITERIA

GO TO E-2, Faulted Steam Generator Isolation", Step 1, if any SG pressure is dropping in an uncontrolled manner or has completely depressurized, and has not been isolated unless needed for RCS cooldown.

3. COLD LEG RECIRCULATION SWITCHOVER CRITERION

GO TO ES-1.3, "Transfer Cold Leg Recirculation", Step 1, if RWST level reduces to less than 19 FEET.

4. AFW SUPPLY SWITCHOVER CRITERION

Monitor PPDWST [WT-TK-10] for AFW pumps supply. Upon reaching low level alarm, 27.5 FEET, refer to Attachment 2-H for makeup.

5. MULTIPLE TUBE RUPTURE CRITERIA

RETURN TO E-3, "Steam Generator Tube Rupture", Step 1, if any intact SG level rises in an uncontrolled manner or any intact SG has abnormal radiation.

6. ADVERSE CONTAINMENT CRITERIA

- CNMT pressure - GREATER THAN 5.0 PSIG

-OR-

- CNMT radiation on [RM-1RM-219A(B)] - GREATER THAN 1E+5 R/HR

-OR-

- Integrated CNMT radiation - GREATER THAN 1E+6 R

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	054AA2.08	
	Importance Rating	2.9	3.3

Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): Steam flow-feed trend recorder.

Proposed Question: Common 65

The Unit is at 50% power during a power increase to 100%.

The following alarms are received in the Control Room:

- 1A, 1B, 1C SG Level Deviation
- 1A, 1B, 1C SG Level Low

The PO determines the following for all 3 SGs:

- SG level is DECREASING
- Steam flow is STABLE
- Feed flow is DECREASING
- Feed Reg Valve positions are all going OPEN
- Feedwater header pressure is approximately 950 psig and trending DOWN slowly

Assuming NO action has been taken by the crew, which one of the following events is the likely cause of these indications?

A. Secondary Load Rejection

B. Loss of Feedwater

C. First Stage Pressure Transmitter PT-446 failed LOW

D. First Stage Pressure Transmitter PT-446 failed HIGH

Proposed Answer: B

Explanation (Optional):

A. Incorrect. On a load rejection, feedwater pressure would be rising, although the other indications may be present, depending on the severity.

B. Correct.

C. Incorrect. Feed Reg. Valves would initially go closed on a FSPT failure. When they went open due to level deviation, feedwater flow would rise.

D. Incorrect. Feed Reg. Valves would be going open until level took over to close them back down. Would not receive a SG low level for this failure.

Technical Reference(s): 1OM-24.4.IF (Attach if not previously provided)
AOP-1.24.1

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-24.1 Objective 17 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		E05EK1.1	
	Importance Rating	3.8	4.1

Knowledge of the operational implications of the following concepts as they apply to the (Loss of Secondary Heat Sink): Components, capacity, and function of emergency systems.

Proposed Question: Common 68

Given the following conditions:

- A Loss of Heat Sink has occurred.
- The crew is establishing RCS 'Bleed and Feed' in accordance with FR-H.1, Loss Of Secondary Heat Sink.
- The RO opens one PORV. He reports that the other two PORVs will NOT open.

Which one of the following describes the consequences of the PORV failures?

A. A Red Path on the Core Cooling CSF will develop due to loss of RCS Inventory with no available makeup.

B. RCS 'Feed and Bleed' cooling must be established to ensure sufficient SI flow at the operable PORV setpoint.

C. The RCS may not depressurize quickly enough to ensure sufficient SI flow to provide RCS heat removal, and other RCS openings may have to be established.

D. 'Bleed and Feed' cooling of the RCS must be terminated and secondary depressurization to inject Condensate pump flow must be immediately initiated.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Although a red condition on Core Cooling may eventually occur, there is available makeup with HHSI.
B. Incorrect. Bleed and Feed is preferable, because SI flow may NOT be adequate at the PORV setpoint.
C. Correct.
D. Incorrect. Action to align condensate pumps is already taken, and not as a contingency to Bleed and Feed.

Technical Reference(s): 1OM-53B.4-FR-H.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
		036AA1.02	
	Importance Rating	3.1	3.5

Ability to operate and/or monitor the following as they apply to the Fuel Handling Incidents: ARM system.

Proposed Question: Common 69

Given the following conditions:

- The Unit is in Mode 6. All systems are in NSA.
- Refueling in progress. The Containment Equipment Hatch is closed.
  - [RIS-1RM-104A], Containment Purge Exhaust Monitor is in High-High alarm.
  - Containment Purge Supply and Exhaust Fans trip.
  - Containment Evacuation Alarm is sounding.

Which one of the following indications will provide direct confirmation of the event in progress?

A. [RIS-1RM-215A], Containment Particulate Monitor

B. [RIS-1VS-103A], Fuel Building Ventilation Exhaust Monitor

C. [RIS-1VS-107A], Elevated Release Particulate Monitor

D. [RM-1RM-218A], Control Room Radiation Monitor

Proposed Answer: A

Explanation (Optional):

A. Correct. Accident is inside Containment if purge is isolated.
B. Incorrect. Would be indicative of accident in Fuel Building.
C. Incorrect. Indicative of accident in Fuel Building.
D. Incorrect. Would possible alarm if equipment hatch was open.

Technical Reference(s): AOP-1.49.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53.1 Objective 7 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
		056AK3.02	
	Importance Rating	4.4	4.7

Knowledge of the reasons for the following responses as they apply to the Loss of Offsite Power: Actions contained in EOP for loss of offsite power.

Proposed Question: Common 70

As directed by ECA-0.0, Loss Of All AC Power, the crew places the charging pumps in Pull-To-Lock.

The defeat of the charging pump automatic start is to prevent...

A. an uncontrolled over-pressurization of the RCS, and the resulting increased loss of RCS inventory through the RCP seals when power is restored.

B. an excessive cooldown of the RCS due to injection of cold RWST water when power is restored.

C. the unnecessary use of water that may be needed for long term recovery.

D. a LOCA caused by thermal shock of the RCP seals when power is restored.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. RCS inventory could be controlled by the CVCS.
B. Incorrect. RWST water won't be used unless a safety injection occurs.
C. Incorrect. Charging draw on RWST is minimal.
D. Correct. RCP seals heat up as the RCS flow up and around the seal package due to a loss of seal injection and seal cooling, then a sudden injection of seal water could thermally shock the seal package.

Technical Reference(s): 1OM-53B.4.ECA-0.0 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # X

Modified Bank # _____ (Note changes or attach parent)

New _____

Question History: Old North Anna Exam

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
		072A2.01	
	Importance Rating	2.7	2.9

Ability to (a) predict the impacts of the following malfunctions or operations on the ARM System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Erratic or failed power supply.

Proposed Question: Common 84

Given the following conditions:

- Unit 1 is in Mode 6.
- Unit 2 is in Mode 1.
- Movement of irradiated fuel is ongoing in the Unit 1 Containment.
- [RM-1RM-218A], Control Room Area Monitor has failed LOW.
- The FAIL light for the radiation monitor is OFF.

What action is required for the above conditions?

A. No action is required because the monitor is not required to be operable.

B. Within ONE hour the respective Unit 2 control room monitor train shall be verified operable.

C. Within ONE hour verify that [RM-1RM-218B], Control Room Area Monitor is operable.

D. Within ONE hour, suspend all operations involving movement of irradiated fuel.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Two monitors required. Action 41 if one is INOPERABLE.
B. Correct.
C. Incorrect. One hour action is to verify Unit 2 is operable. Unit 1 is operable unless otherwise indicated.
D. Incorrect. Action for Unit 2 rad monitor INOPERABLE.

Technical Reference(s): TS table 3.3.6 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-43.1 Objective 9 (As available)

Question Source: Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: 1LOT3 2001 Audit #98

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:
One hour entry into TS action.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
		G2.2.12	
	Importance Rating	3.0	

Knowledge of Surveillance procedures

Proposed Question: RO 36

When performing an OST, which one of the following conditions PROHIBITS the use of "N/A" in the sign-off spaces provided?

A. Performance of partial tests.

B. Inability to perform the OST as written.

C. Performing an OST that pre-establishes conditions for non-performance of steps.

D. Performance of steps that cannot be performed due to plant conditions but do not change the intent of the procedure.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Partial tests allow use of N/A.
B. Correct. Must issue a revision after placing equipment in a safe condition.
C. Incorrect. N/A specifically used for this condition.
D. Incorrect. May use N/A as long as intent is not altered.

Technical Reference(s): 1/2-ADM-0104 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SSG-Admin Objective 5 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	051AA2.02	
	Importance Rating	3.9	

Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Conditions requiring a reactor and/or turbine trip

Proposed Question: RO 50

Given the following conditions:

- The Unit is operating at 70% power when air leakage into the condenser resulted in a rising condenser backpressure.
- A load reduction is initiated at a rate of 5% per minute in accordance with AOP-1.51.1, "Emergency Shutdown."
    - Five minutes after the load reduction was commenced, condenser backpressure has risen to 5.5 In. Hg. Abs.
    - Ten minutes after the load reduction was commenced, condenser backpressure has risen to 9 In. Hg. Abs. and is continuing to rise.

What operator action is required?

A. Trip the Reactor and go to EOP E-0, Reactor Trip Or Safety Injection.

B. Trip the Turbine and go to AOP 1.26.1, Turbine And Generator Trip.

C. Continue the load reduction and place a priming ejector (Hogger) into service.

D. Continue the load reduction. A priming ejector (Hogger) should not be placed into service.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. If condenser backpressure remains > 5.5 In. Hg. Abs. for more than five minutes, and turbine load is > P9 (49%), a Rx trip is required. The plant was operating at 100% power when air leakage into the condenser began, and power was reduced to 45% over the next eleven minutes.
B. Correct. The plant was operating at 100% power when air leakage into the condenser began, and power was reduced to 45% over the next eleven minutes. Turbine trip is required if condenser backpressure remains > 5.5 In. Hg. Abs. for more than five minutes, and turbine load is < P9 (49%).
C. Incorrect. A priming ejector shall not be placed into service if condenser backpressure is > 5 In. Hg. Abs. Also, Rx trip is required.

D. Incorrect. Turbine trip is required.

Technical Reference(s): 1OM-26.4AAS (Attach if not previously provided)
1OM-26.4.AAC

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-26.1 Objective 17 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:
Closed reference because the candidate is required to determine what power level the plant is at, expected to know the P-9 setpoint, and expected to know actions required for turbine or reactor trip on low vacuum.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	057AK3.01	
	Importance Rating	4.1	

Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: Actions contained in EOP for loss of vital AC electrical instrument bus.

Proposed Question: RO 51

While responding to a loss of all emergency AC power in accordance with ECA-0.0, Loss Of All Emergency 4KV AC Power, the vital instrument busses are verified energized simultaneously with restoring power to the AC Emergency busses to assure ...

A. Reactor trip can be verified.

B. AFW flow can be determined.

C. Generator trip can be verified.

D. Nuclear instrumentation is energized.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Reactor trip can be verified by checking reactor trip and bypass breakers open. This is performed prior to energizing the Vital Instrument busses.
B. Incorrect. AFW flow is determined prior to energizing the Vital Instrument busses. If AFW flow cannot be determined in the control room, then an operator is dispatched to locally verify AFW status.
C. Incorrect. Generator Trip is verified prior to energizing the Vital Instrument busses. If breakers will not open or Generator volts are indicated, then the system operator will deenergize the 345KV busses.
D. Correct. NI instrumentation is powered by the Vital Instrument busses. Without power, NIs are unavailable.

Technical Reference(s): ECA-0.0 Step 37 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

As close as we could get to the required topic with available references. TS also requires vital instrument busses to assure required instrumentation available for safe shutdown. The way step 37 is written in ECA-0.0, it directs verifying NIs energized if the annunciators are not working. The basis provides no additional supporting information.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
		E04EA2.2	
	Importance Rating	3.6	

Ability to determine and interpret the following as they apply to the LOCA Outside Containment: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: RO 57

Given the following conditions:

- A Small Break LOCA has occurred outside containment.
- ECA-1.2, LOCA Outside Containment, has been entered.
- RCS pressure is slowly dropping.
- One HHSI pump is injecting.

As valves are being closed in an effort to identify and isolate the leak, a second HHSI pump is made available; the pump is started and is injecting.

RCS pressure begins slowly rising.

Which one of the following is correct regarding adherence to the EOPs?

The crew should...

A. continue in ECA-1.2 until Mode 4 can be entered.

B. continue in ECA-1.2 until break isolation is verified using other means.

C. exit ECA-1.2 and transition to E-1, Loss of Reactor Or Secondary Coolant.

D. exit ECA-1.2 and transition to ECA-1.1, Loss Of Emergency Coolant Recirculation.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Transition will be made from ECA-1.2 in any case.
B. Correct. For some breaks, SI flow may cause an RCS pressure increase independent of break isolation. In such cases, other means of verifying break isolation should be checked.
C. Incorrect. Only would transition to E-1 if break was isolated.
D. Incorrect. Only would transition to ECA-1.1 if LOCA could not be isolated.

Technical Reference(s): 1OM-53B.4-ECA-1.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: ECA-1.2

Learning Objective: 3SQS-53.3 Objectives 2 and 3 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Record Type #A9.350C

Beaver Valley Power Station

UNIT 1

1OM-53A.1.ECA-1.2(ISS1C)

LOCA Outside Containment

Issue 1C Revision 0

Prepared by C. O'Neill	Date 06/28/00	Pages Issued 1 through 5	Effective Date MAR 2 9 2001
Reviewed by M. P. Flynn	Date 06/28/00	Validated by N/A	Date
OSC Meeting No. BV-OSC-02-01	Date 01/09/01	Approved by	Date 3-23-2001

CONTROLLED
BVPS UNIT 1

Number	Title	
ECA-1.2	**LOCA Outside Containment**	**Issue 1C Revision 0**

A. PURPOSE

This procedure provides actions to identify and isolate a LOCA outside containment.

B. SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from:

1. E-0, "Reactor Trip Or Safety Injection", Step 31, on abnormal radiation in the auxiliary building due to a loss of RCS inventory outside containment.

2. E-1, "Loss of Reactor Or Secondary Coolant", Step 17, if it is determined that the cause of abnormal radiation is due to a loss of RCS inventory outside containment.

C. APPLICABLE MODES

ECA-1.2, "LOCA Outside Containment" is applicable in Modes 1, 2 and 3. Refer to 1/2OM-53B.2, "User's Guide", Section V, "Modes of Applicability Of The EOPs" for a detailed discussion of this subject.

Number	Title	
ECA-1.2	**LOCA Outside Containment**	**Issue 1C Revision 0**

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	Check Control Room Habitability	Verify the Control Room Habitability system actuated:
	a. Check the following:	1) At Unit 1 BSP check the following:
	1) Control Room radiation [RM-1RM-218A,B] - NOT IN HIGH ALARM	a) All five Control Room bottled air RED lights are LIT.
	2) Containment Isolation Phase B - HAS NOT OCCURRED	b) Both emergency ventilation timers are RUNNING.
	• Containment pressure - HAS REMAINED LESS THAN 8 PSIG ON [PR-1LM-100A]	c) [1VS-D-40-1A(B)], Control Room Air Intake Dampers are closed.
		d) [1VS-D-40-1C(D)], Control Room Air Exhaust Dampers are closed. IF NOT, THEN manually activate Bottled Air System at BSP (both trains).
		2) Request a BV-2 operator to verify proper CREBAPS actuation has taken place.
		3) Continue with Step 2 AND WHEN the one hour CREBAPS timer has elapsed at BSP, THEN start one of four Control Room emergency pressurization fans.
		a) Refer to 1/2OM-44A.4A.4, "Post Control Room Emergency Habitability System Activation/Recovery," Part A.

Number	Title	
ECA-1.2	**LOCA Outside Containment**	**Issue 1C Revision 0**

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.	Verify Proper Valve Alignment	Manually close valves.
	a. [MOV-1SI-890A,B] LHSI To RCL Hot Legs - CLOSED	IF valves can NOT be manually closed, THEN locally close valves.
	b. Other paths to outside containment are isolated: • Sample system and PASS • [1RH-15], RWST Return Isol Vlv (SFGDS - 747',RR) - CLOSED • [MOV-1CH-142], RH LTDN To Non Regen Hx Inlet Flow Control Vlv - CLOSED • [MOV-1CC-112A3,B3], RH Hx CCR Outlet Isol Vlvs - CLOSED • [1PC-10], Refuel Cavity Suction CNMT Pen Isol Vlv (SFGDS - 722', Pen A, Key SR/O.G) - CLOSED • [TV-1CH-204], Regen Hx/LTDN Outlet CNMT Isol Vlv - CLOSED	

Number	Title	
ECA-1.2	**LOCA Outside Containment**	**Issue 1C Revision 0**

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

3. Try To Identify And Isolate Break

a. Close [MOV-1SI-890C] LHSI To RCS Cold Legs.

b. Check RCS pressure - NOT RISING — b. GO TO Step 4.

c. Open [MOV-1SI-890C] LHSI To RCS Cold Legs.

d. Check Aux Bldg and Safeguards area sump level annunciators - ANY LIT — d. GO TO Step 3.e.

- A11-21, "AUX BLDG WELL SUMP LEVEL HIGH"
- A11-22, "AUX BLDG NORTH SUMP LEVEL HIGH"
- A11-23, "TUNNEL SUMP LEVEL HIGH"
- A11-28, "SAFEGUARD AREA SUMP LEVEL HIGH"
- A11-29, "FUEL BLDG SUMP LEVEL HIGH"
- A11-30, "AUX BLDG SOUTH SUMP LEVEL HIGH"
- A11-36, "CHARGING PP-1A CUBICLE SUMP LEVEL HIGH"
- A11-37, "CHARGING PP-1B CUBICLE SUMP LEVEL HIGH"
- A11-38, "CHARGING PP-1C CUBICLE SUMP LEVEL HIGH"

(step continued next page)

Number	Title	
ECA-1.2	**LOCA Outside Containment**	**Issue 1C Revision 0**

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

3. (continued from previous page)

e. Check Aux Bldg and Safeguards radiation monitors multipoint and SPING recorders:

- [RM-1VS-102A,B], Aux Bldg Exh Sys A and B Gas
- [RM-1RM-209], Aux Bldg Bot Flr North
- [RM-1RM-210], Aux Bldg 3rd Flr
- [RM-1RM-211], Aux Bldg Bot
- [RM-1RM-212], Sample Room
- [RM-1VS-105], Leak Collection Area Gas
- [RM-1VS-107A,B], Elevated Release Point And Gas
- [RM-1VS-110], CNMT/SLCRS Exhaust Monitor SPING 4
- [RM-1VS-112], CNMT/SLCRS Exhaust Monitor SA 9/10

e. Dispatch operator(s) or Health Physics to search for reactor coolant leak outside CNMT.

f. Close appropriate valves to isolate the LOCA outside CNMT.

1) Monitor RCS pressure.

4. <u>Check If Break Is Isolated</u>

a. RCS pressure - RISING

a. GO TO ECA-1.1, "Loss Of Emergency Coolant Recirculation," Step 1.

b. GO TO E-1, "Loss Of Reactor Or Secondary Coolant," Step 1.

- END -

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
		058AA2.02	
	Importance Rating	3.3	

Ability to determine and interpret the following as they apply to the Loss of DC Power: 125V dc bus voltage, low/critical low, alarm.

Proposed Question: RO 66

The Unit is operating at 60% power when the following alarms are received.

- [A9-100], 125VDC BATTERY CHGR 1 FAILURE
- [A9-98], 125VDC BUS 1 VOLTAGE LOW

Several minutes after the alarms are received:

- The Unit continues to operate at 60% power.
- Control power remains available to EDG No.1 and 4160V bus 1AE.
- 125VDC Bus 1 Voltage indicates approximately 124VDC.
- Station Battery Charger Breaker [BAT-CHG1-1] has been verified closed and 480V MCC1-E9 is energized.

For the given indications, which one of the following describes the 125VDC Bus 1 status?

A. Station Battery has failed. Battery Charger 1 is supplying the bus.

B. Battery Charger 1 has failed. Station Battery is supplying 125VDC Bus 1.

C. Station Battery and Battery Charger 1 have failed. 125VDC Bus 1 is deenergized.

D. Battery Charger 1 and Station Battery are operating normally. Battery Charger is supplying 125VDC Bus 1.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. If Battery Charger 1 were supplying the normal bus loads, DC bus voltage would indicate between 127.8V and 135V.
B. Correct. When a battery charger is lost, the station battery will automatically supply power to the loads on the effected bus. Without the float charge normally provided by the battery charger, DC bus voltage will not be maintained between 127.8V and 135V.
C. Incorrect. Would have resulted in a loss of control power to EDG No.1 and 4160Vbus 1AE.
D. Incorrect. If Battery Charger 1 and Station Battery are operating normally the alarms would not have been received. Also, if Battery Charger 1 were supplying the normal bus loads, DC bus voltage would indicate between 127.8V and 135V.

Technical Reference(s): 1OM39.4 Annunciators (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-39.1 Objective 12 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
		029EA1.01	
	Importance Rating	3.4	

Ability to operate and/or monitor the following as they apply to the ATWS: Charging Pumps

Proposed Question: RO 67

Given the following conditions:

- The Unit was operating at 100% power when a Steam Line Break occurred.
- A high containment pressure condition resulted in a reactor trip signal. However, the reactor failed to trip automatically or manually.
- All other equipment functions as designed.
- Containment pressure is 3.5 psig and rising.
- The crew is performing actions of FR-S.1, Response To Nuclear Power Generation/ATWS.

Which one of the following describes the plant status when verifying emergency boration is established?

A. One charging pump running; [MOV-1CH-350], Emergency Boration Isolation Vlv OPEN; Boric Acid Transfer Pump [1CH-P-2A (2B)] in fast speed.

B. Two charging pumps running; [MOV-1CH-350], Emergency Boration Isolation Vlv OPEN; Boric Acid Transfer Pump [1CH-P-2A (2B)] in fast speed.

C. One charging pump running; [MOV-1CH-115B (D)], RWST to Chg Pumps Suct Vlv OPEN; [MOV-1CH-115C (E)], VCT Outlet to Chg Pumps Suct Vlv CLOSED, and [MOV-1SI-867A, C, (B)(D)], BIT Isol Vlvs open.

D. Two charging pumps running; [MOV-1CH-115B (D)], RWST to Chg Pumps Suct Vlv OPEN; [MOV-1CH-115C (E)], VCT Outlet to Chg Pumps Suct Vlv CLOSED, and [MOV-1SI-867A, C, (B)(D)], BIT Isol Vlvs open.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Two HHSI pumps running due to SI signal.
B. Incorrect. MOV-350 will not be opened because HHSI already aligned to RWST.
C. Incorrect. Two HHSI pumps running due to SI signal.
D. Correct. When the reactor trip signal is generated on high containment pressure, SI is also initiated; therefore, two HHSI pumps will be running; charging pump suctions will be aligned to the RWST, and the BIT isolation valves are open.

Technical Reference(s): FR-S.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	3	
		065G2.4.50	
	Importance Rating	3.3	

Emergency Procedures/Plan: Ability to verify system alarm set points and operate controls identified in the alarm response manual

Proposed Question: RO 71

The Unit is operating at 100% power, NSA when the following alarms are received.

- [A6-99], STA AIR COMPR 1A RCVR TANK PRESS LOW
- [A6-107], STA AIR COMPR 1A RCVR TANK PRESS LOW

[PI-1SA-101A/B], Station Air Compressor Receiver Pressures indicate 85 psig, and Station Air Main Header Pressure [PI-1SA-101] indicates 80 psig.

Which one of the following indicates the expected plant response?

A. Both Station Air Compressors running; Station Air Header Isolation Valve, [TV-1SA-105], open.

B. One Station Air Compressor running; Station Air Header Isolation Valve, [TV-1SA-105], open.

C. One Station Air Compressor running; Station Air Header Isolation Valve, [TV-1SA-105], closed.

D. Both Station Air Compressors running; Station Air Header Isolation Valve, [TV-1SA-105], closed.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. TV-1SA-105 will close below 95 psig.
B. Incorrect. TV-1SA-105 will close below 95 psig and both SA compressors will be running.
C. Incorrect. Both SA compressors will be running.
D. Correct. TV-1SA-105 closes at 95 psig on Station Air Main Header Pressure [PI-1SA-101]. The standby SA Compressor starts at 95 psig. One compressor will already be running.

Technical Reference(s): 1OM-34.4AAC (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-34.1 Objective 3 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
		056K1.03	
	Importance Rating	2.6	

Knowledge of the physical connections and/or cause-effect relationships between the Condensate system and the following system: MFW

Proposed Question: RO 72

The Unit is operating at 100% power when BOTH of the running condensate pumps trip.

Which one of the following describes the expected Main Feed Pump response?

A. 1FW-P-1A and 1FW-P-1B both trip immediately.

B. 1FW-P-1A and 1FW-P-1B both trip after an 8 second delay.

C. 1FW-P-1A trips after an 8 second delay; 1FW-P-1B trips immediately.

D. 1FW-P-1B trips after an 8 second delay; 1FW-P-1A trips immediately.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Low suction pressure should be in for 8 seconds.
B. Correct. Both feed pumps trip on low suction pressure of 250 psig after an 8 second delay.
C. Incorrect. Both pumps have same trip function.
D. Incorrect. Both pumps have same trip function.

Technical Reference(s): 1OM-24.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-24.1 Objective 5 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
		059G2.1.23	
	Importance Rating	3.9	

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Proposed Question: RO 73

Given the following conditions:

- The Unit is operating at 90% power. All systems are in NSA.
- "A" Main Feed Pump has tripped.
- The PO determines that heater drain pumps and condensate pumps are operating normally.
- The Unit Supervisor refers to AOP-1.24.1, Loss of Main Feedwater.

Which one of the following actions is required in accordance with AOP-1.24.1, Loss of Main Feedwater?

A. Trip the reactor and enter E-0, Reactor Trip Or Safety Injection.

B. Reduce turbine load to less than 60% in accordance with AOP-1.51.1, Emergency Shutdown.

C. Check the proper operation of [FCV-1FW-150A], Main Feed Pump "A" Recirc Valve.

D. Determine if suction pressure is adequate to attempt restart of "A" Main Feed Pump.

Proposed Answer: A

Explanation (Optional):

A. Correct. With power > 80% and only one feed pump running, go to E-0.
B. Incorrect. If power was less than 80%, this is the appropriate action.
C. Incorrect. This action would be performed if entry to E-0 was not required.
D. Incorrect. This action would be required if entry to E-0 was not required.

Technical Reference(s): AOP-1.24.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53C.1 Objective 1 and 5 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
		059K4.16	
	Importance Rating	3.1	

Knowledge of MFW System design feature(s) and/or interlock(s) which provide for the following: Automatic Trips for MFW pumps

Proposed Question: RO 74

Which one of the following will automatically trip [1FW-P-1A] MFW Pump?

A. 2 out of 3 Lo-Lo level in any SG.

B. Reactor trip coincident with low Tavg.

C. 1FW-P-1A lube oil pressure 4 psig.

D. Feedwater pump discharge valve [MOV-1FW-150A] shut.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Lo-Lo level is an automatic start signal for the Auxiliary Feed Pumps.
B. Incorrect. Feedwater Isolation is generated, but not SGFP trip.
C. Correct. Lube oil pressure 5 psig or less is a Feed Pump trip signal.
D. Incorrect. MOV-1FW-150A shut is a start interlock for 1FW-P-1A.

Technical Reference(s): 1OM-24.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-24.1 Objective 13 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level:	Memory or Fundamental Knowledge	X
	Comprehension or Analysis	
10 CFR Part 55 Content:	55.41	X
	55.43	

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
		061A1.02	
	Importance Rating	3.3	

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits associated with operating the AFW controls including: S/G pressure.

Proposed Question: RO 75

While shutting down the Unit during severe weather conditions, a reactor trip occurs from 90% power due to a loss of power to the Unit Station Service Transformer.

The following conditions exist.

- The plant is in natural circulation.
- MSIVs are closed.
- Both MDAFW pumps are in service feeding all 3 SGs.
- All SG wide range levels are approximately 35%.

If [MOV-1FW-151E], Auxiliary Feed Throttle Valve begins drifting open, which one of the following describes the expected impact on the affected SG?

A. Pressure rises; level rises.

B. Pressure rises; level drops.

C. Pressure drops; level rises.

D. Pressure drops; level drops.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. As MOV-1FW-151E drifts open, feed flow increases to the 1A SG, lowering the temperature of the 1A SG inventory. Because the 1A SG is at saturation conditions, pressure in the 1A SG will also lower.
B. Incorrect. As MOV-1FW-151E drifts open, feed flow increases to the 1A SG, causing level to rise. Pressure will drop to due saturation conditions in the SG.
C. Correct. As MOV-1FW-151E drifts open, feed flow increases to the 1A SG, lowering the temperature of the 1A SG inventory. Because the 1A SG is at saturation conditions, pressure in the 1A SG will also lower.
D. Incorrect. As MOV-1FW-151E drifts open, feed flow increases to the 1A SG, causing level to rise.

Technical Reference(s): 1OM-24.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-24.1 Objective 5 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
		061K5.01	
	Importance Rating	3.6	

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

Proposed Question: RO 76

A reactor trip occurs from 100% power due to a loss of main feedwater.

The following conditions exist:

- All RCPs are running.
- The TDAFW pump is in service feeding all 3 SGs.
- Both MDAFW pumps tripped upon startup and remain unavailable.
- The TDAFW pump speed has begun to slowly lower due to a malfunctioning governor.

Which one of the following describes the expected impact on Pressurizer level if the TDAFW pump speed CONTINUES to lower?

Pressurizer level...

A. rises due to increased primary to secondary heat transfer.

B. rises due to decreased primary to secondary heat transfer.

C. lowers due to increased primary to secondary heat transfer.

D. lowers due to decreased primary to secondary heat transfer.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Heat Transfer is reduced with lower feed water flow.
B. Correct. The TDAW Pump capacity is directly proportional to pump speed; therefore, as pump speed continues to lower, feed flow to all 3 SGs will lower. With a decrease in cooler AFW flow into the SGs, the temperature of the inventory on the secondary side of all three SGs will rise, resulting in a decreased primary to secondary heat transfer rate, and an RCS temperature increase, causing pressurizer level and pressure to rise.
C. Incorrect. Heat transfer is reduced due to lower feedwater flow.
D. Incorrect. Level will rise because RCS volume rises as temperature rises due to decreased heat removal.

Technical Reference(s): 1OM-53B.4-FR-H.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-24.1 Objective 5 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	068A3.02	
	Importance Rating	3.6	

Ability to monitor automatic operation of the Liquid Radwaste System including: Automatic isolation.

Proposed Question: RO 77

Given the following conditions:

- Unit 1 is at 100% power. All systems are in NSA.
- A batch discharge of the contents of [1LW-TK-7A], Steam Generator Drain Tank 7A is in progress.
- The [RM-1LW-104A], Liquid Waste Effluent Monitor has generated a High-High radiation signal.

How will this affect the Liquid Waste Disposal System?

A. The Liquid Waste Effluent Trip Valve [TV-LW-105] receives an open signal and the Liquid Waste Effluent Low Range Flow Control Valve [FCV-LW-104-1] closes.

B. The running Steam Generator Drain Tank Pump will stop and the Liquid Waste Effluent Low Range Flow Control Valve [FCV-LW-104-1] closes.

C. The running Steam Generator Drain Tank Pump will stop and the Liquid Waste Effluent High Range Flow Control Valve [FCV-LW-104-2] closes.

D. Both the Liquid Waste Effluent High and Low Range Flow Control Valves [FCV-LW-104-1 and FCV-LW-104-2] and the Liquid Waste Effluent Trip Valve [TV-LW-105] receive a signal to close.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. [TV-LW-105] receives a closed signal on high radiation.
B. Incorrect. The radiation signal does not generate a signal to stop the Steam Generator Drain Tank Pump.
C. Incorrect. The radiation signal does not generate a signal to stop the Steam Generator Drain Tank Pump.

D. Correct. All three valves receive a close signal on high radiation.

Technical Reference(s): 1OM-17.1.D (Attach if not previously provided)
1OM17 Figure 17-22

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-17.1 Objective 5 (As available)

Question Source: Bank # 1SQS-17-05-01
Modified Bank # (Note changes or attach parent)
New

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	071A2.03	
	Importance Rating	2.7	

Ability to (a) predict the impacts of the following malfunctions or operations on the Waste Gas Disposal System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Rupture disk failures.

Proposed Question: RO 78

Unit 1 is operating at 100% power with all systems in NSA.

- Unit 2 Gaseous Waste Surge Tank is being transferred to Unit 1 Waste Gas Decay Tank 1B [1GW-TK-1B].
- GASEOUS WASTE DECAY TANK 1B PRESSURE HIGH is alarming.
- [1GW-TK-1B] pressure indicates 65 psig.

Which one of the following actions will be required?

A. Place [GW-TK-1A] in service to prevent the Unit 2 Overhead Gas Compressor from stalling.

B. Place [GW-TK-1C] in service to prevent overpressure on the Unit 2 Waste Gas Surge Tank.

C. Place [GW-TK-1A] in service to maintain O2 Analyzer within its operating limits.

D. Place [GW-TK-1C] in service to equalize pressure and reseat the WGDT 1B relief valve.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The Overhead Gas Compressor will be pumping against a higher pressure but will not stall against 65 psig.
B. Correct. Rupture disc will fail at 100 psig and vent the WGST to the degassifiers.
C. Incorrect. The operation of the O2 Analyzer will be unaffected by pressure on the WG Header.
D. Incorrect. Relief lifts at 100 psig and pressure will not be equalized, the tanks will be isolated from each other.

Technical Reference(s): 1OM-19.4.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-19.1 Objective 21 (As available)

Question Source: Bank #
Modified Bank # 1SQS-19-21-01 (Note changes or attach parent)
New

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	071K4.06	
	Importance Rating	2.7	

Knowledge of Waste Gas Disposal System design feature(s) and/or interlock(s) which provide for the following: Sampling and monitoring of waste gas release tanks.

Proposed Question: RO 79

Given the following conditions:

- Unit 1 is in Mode 4.
- A Unit shutdown is in progress.
- Waste Gas Decay Tank 1B [1GW-TK-1B] discharge is in progress.
- Radiation Monitor [RM-1GW-108A] is in a High-High alarm.

Which one of the following will occur?

A. Waste Gas Decay Tank Bleed Isolation Valve [TV-1GW-103B2] closes.
Waste Tank Discharge Header Cooling Tower Isolation Valve [TV-1GW-103] opens.

B. Waste Gas Decay Tank Bleed Isolation Valve [TV-1GW-103B2] opens.
Waste Tank Discharge Header Cooling Tower Isolation Valve [TV-1GW-103] closes.

C. Waste Gas Decay Tank Bleed Isolation Valve [TV-1GW-103B2] closes.
Waste Tank Discharge Header Cooling Tower Isolation Valve [TV-1GW-103] closes.

D. Waste Gas Decay Tank Bleed Isolation Valve [TV-1GW-103B2] opens.
Waste Tank Discharge Header Cooling Tower Isolation Valve [TV-1GW-103] opens.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Both valves close.
B. Incorrect. Both valves close.
C. Correct.
D. Incorrect. Both valves close.

All plausible because both valves do operate and if the candidate does not understand system

and valve function, could choose any of the distractors.

Technical Reference(s): 1OM-19.1.B (Attach if not previously provided)
1OM-19.1.D

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-19.1 Objective 6 (As available)

Question Source: Bank #
Modified Bank # 1SQS-19-06-01 (Note changes or attach parent)
New

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
		075K1.02	
	Importance Rating	2.9	

Knowledge of the physical connections and/or cause-effect relationships between the circulating water system and the following systems: Liquid radwaste discharge.

Proposed Question: RO 80

A precaution contained in 1OM-17, Liquid Waste Disposal states that two tanks containing radioactive liquid cannot be discharged at the same time.

Which one of the following describes the reason for this precaution?

A. The discharge permit for discharging the contents of a liquid waste tank is based upon a dilution rate which includes cooling tower blowdown rate of both units.

B. Pipe size restrictions in the effluent line could result in an overpressure condition if more than 1 waste tank pump is in operation.

C. The limit prevents excessive wear on the foot valve in the discharge structure due to high flow rates.

D. The common discharge point is only provided with a limited amount of dilution flow from the Unit 1 cooling tower blowdown.

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. There are no pipe size restrictions, as either Unit can discharge to its own or the other unit's cooling tower blowdown.
C. Incorrect. Insignificant flow compared to blowdown.
D. Incorrect. No common discharge point actually exists. The piping is tied so that either unit can discharge to either cooling tower blowdown.

Technical Reference(s): 1OM-17 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-17.1 Objective 7 (As available)

Question Source: Bank # _____
Modified Bank # X (Note changes or attach parent)
New _____

Question History: Bank #1SQS-17-07-01

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
		072K1.04	
	Importance Rating	3.3	

Knowledge of the physical connections and/or cause-effect relationships between the ARM system and the following system: Control Room ventilation.

Proposed Question: RO 81

The Unit is operating at 100% power, NSA when a High radiation signal is received on [RM-1RM-218A (B)], Control Room Area Monitors.

Which one of the following describes an expected component response for the Unit 1 Control Room Ventilation System?

A. One Control Room Emergency Supply Fan [1VS-F41A (B)] starts immediately.

B. The Control Room Air Intake Dampers [1VS-D-40-1A (B)] shut immediately.

C. One Control Room Emergency Supply Fan [1VS-F41A (B)] starts after a time delay.

D. The Control Room Air Exhaust Dampers [1VS-D-40-1C (D)] shut after a time delay.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The control switches for the Unit 1 Control Room Emergency Supply Fans are verified to be in the Stop position. The Emergency Supply Fans must NOT auto start. They serve as a manually initiated backup for [2HCV-FN241A (B)].
B. Correct. A high radiation signal from RM-1RM-218A or (B) will initiate immediate closure of the Control Room Air Intake Dampers and the Control Room Air Exhaust Dampers.
C. Incorrect. The control switches for the Unit 1 Control Room Emergency Supply Fans are verified to be in the Stop position. The Emergency Supply Fans must NOT auto start. They serve as a manually initiated backup for [2HCV-FN241A (B)]. The timers associated with these fans no longer perform any automatic functions.
D. Incorrect. A high radiation signal from RM-1RM-218A or (B) will initiate immediate closure of the Control Room Air Intake Dampers and the Control Room Air Exhaust Dampers.

Technical Reference(s): 1OM-43.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-43.1 Objective 6 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 41
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
		063K1.02	
	Importance Rating	2.7	

Knowledge of the physical connections and/or cause-effect relationships between the DC electrical system and the following systems: AC electrical system.

Proposed Question: RO 82

Given the following conditions:

- A reactor trip from 100% power has occurred as a result of a Small Break LOCA.
- HHSI Pumps are running.
- LHSI Pumps are running.
- Quench Spray Pumps are running.

Subsequently, a fault on 125V DC Distribution Panel 2 results in a loss of 125V DC power to all loads serviced by the panel.

Which one of the following describes the impact on the AC electrical system?

4KV loads on 4160V Bus...

A. 1DF immediately trip; loads on 4160V Bus 1AE also immediately trip.

B. 1AE continue to operate; loads on 4160V Bus 1DF also continue to operate.

C. 1DF continue to operate; however, loads on 4160V Bus 1AE immediately trip.

D. 1AE continue to operate; however, loads on 4160V Bus 1DF immediately trip.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Running loads do not trip.
B. Correct. A loss of 125V DC Distribution Panel 2 results in a loss of control power for 4160V Bus 1DF. When control power is lost to 4160V Bus 1DF, all breakers on 4160V Bus 1DF lose control power to their trip and closing coils; however, all previously closed 4160V breakers remain shut and cannot be remotely or automatically tripped. 4160V Bus 1AE is unaffected by a loss of 125V DC Distribution Panel 2; therefore, loads on 4160V Bus 1AE also continue to operate.
C. Incorrect. No running loads trip.
D. Incorrect. No running loads trip.

Technical Reference(s): 1OM-36.1 (Attach if not previously provided)
Table 1OM-39-6

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-39.1 Objective 7 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
		064K3.02	
	Importance Rating	4.2	

Knowledge of the effect that a loss or malfunction of the ED/G system will have on the following: ESFAS controlled or actuated systems.

Proposed Question: RO 83

Given the following conditions:

- A reactor trip from 100% power has occurred as a result of a Small Break LOCA.
- Immediately following the reactor trip, SSST "1A" and SSST "1B" are disabled by a lightning strike.
- HHSI Pumps are running.
- LHSI Pumps are running.
- Quench Spray Pumps are running.

Then, EDG No.1 trips and cannot be recovered.

Which one of the following describes the impact on plant systems?

A. HHSI Pump "A" is running; LHSI Pump "B" is tripped.

B. HHSI Pump "B" is running; LHSI Pump "A" is tripped.

C. HHSI Pump "A" is running; LHSI Pump "A" is tripped.

D. HHSI Pump "B" is running; LHSI Pump "B" is tripped.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Train "A" equipment will lose power when No. 1 EDG trips.
B. Correct. A loss of EDG No.1 results in a loss of power for 4160V Bus 1AE. When power is lost to 4160V Bus 1AE, all loads on 4160V Bus 1AE are deenergized. 4160V Bus 1DF is unaffected by a loss of EDG No.1; therefore, loads on 4160V Bus 1DF continue to operate.
C. Incorrect. Train "A" equipment will lose power when No. 1 EDG trips.
D. Incorrect. Train "B" will not lose power.

Technical Reference(s): 1OM-36.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-36.2 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
		086A3.03	
	Importance Rating	2.9	

Ability to monitor automatic operation of the Fire Protection System including: Actuation of fire detectors.

Proposed Question: RO 85

The following alarms are received in the Control Room:

- [A11-65], DIESEL GEN BLDG A FIRE
- [A11-81], DIESEL GEN BLDG A FIRE PROT SYSTEM TROUBLE

Which one of the following describes the operation of the Fire Protection System?

The "A" Diesel Generator Building...

A. Sprinkler system will discharge immediately.

B. CO2 system will discharge immediately.

C. Sprinkler system will discharge in 30 seconds.

D. CO2 system will discharge in 30 seconds.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. DG building is CO2 protected.
B. Incorrect. Pre-discharge alarm immediately, discharge in 30 seconds.
C. Incorrect. DG building is CO2 protected.
D. Correct.

Technical Reference(s): 1OM-33.4.AAL (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-33.1, Objective 8 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
		045K4.43	
	Importance Rating	2.8	

Knowledge of MT/G system design feature(s) and/or inter-lock(s) which provide for the following: T-ave. program, in relation to SDS controller.

Proposed Question: RO 86

Given the following conditions:

- A load rejection has occurred.
- Reactor power is currently 65%.
- Tavg is 6°F higher than Tref.

How many banks of Condenser Steam Dump valves will either be open or partially open?

A. 1

B. 2

C. 3

D. 4

Proposed Answer: A

Explanation (Optional):

A. Correct. After a 2 degree deadband, each bank starts open sequence at approximately 6.5 degree F intervals. A 4-20 milliamp signal opens banks sequentially to 100% of capacity at a 28 degree mismatch. After a 2 degree deadband, Bank 1 throttles open based on mismatch. At approximately 8.5 degree mismatch, Bank 2 will start throttling open.
B. Incorrect. Not enough mismatch.
C. Incorrect. Not enough mismatch.
D. Incorrect. Not enough mismatch.

Technical Reference(s): 1OM21 Figure 21-14 (Attach if not previously provided)
1OM-21.1.D

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-21.1 Objective 8 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
		045A1.06	
	Importance Rating	3.3	

Proposed Question: RO 87

Given the following conditions:

- The Unit was operating at 28% power.
- All offsite power was lost.
- All equipment functioned as designed.

Which one of the following describes the approximate steady-state Tcold value following the loss of power?

A. 543°F

B. 547°F

C. 551°F

D. 555°F

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Would assume that loss of power caused additional cooldown of RCS beyond normal post-trip parameters.
B. Incorrect. Main Steam Dump pressure setpoint would maintain Tavg at this value, but Circ Pumps are off and steam dump not available.
C. Correct. The ADVs will pop open at 1060 psig and maintain Tavg at a lower value (550-553).
D. Incorrect. To reach this temperature, a malfunction of ADVs must occur.

Technical Reference(s): 1OM-21.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-21.1 Objective 8 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
		076A4.01	
	Importance Rating	2.9	

Ability to manually operate and/or monitor in the control room: SWS pumps.

Proposed Question: RO 88

Given the following conditions:

- A reactor trip and safety injection have occurred.
- The crew is performing EOP Attachment 1-K, Verification of Automatic Actions.
- CIB has just occurred.

If all equipment functions as designed, which one of the following describes the status of the River Water Pumps?

A. No pumps running

B. One pump running

C. Two pumps running

D. Two pumps running with two Aux River Water pumps running

Proposed Answer: C

Explanation (Optional):

A. Incorrect. CCR pumps will be stopped on CIB.
B. Incorrect. One pump per train will be running.
C. Correct.
D. Incorrect. Auxiliary river water only started if river water cannot be started.

Technical Reference(s): Attachment 1-K (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-30.2 Objective 13 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
		078K4.03	
	Importance Rating	3.1	

Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Securing of SAS upon loss of cooling water.

Proposed Question: RO 89

Which one of the following will cause a trip of a Station Air Compressor?

A. High Oil Pressure

B. Low Oil Temperature

C. High Water Pressure

D. High Outlet Air Temperature

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Low oil pressure causes a trip.
B. Incorrect. High oil temperature causes a trip.
C. Incorrect. High water pressure is an alarm for the containment air compressors.
D. Correct. LP or HP air temperature will trip the station air compressor.

Technical Reference(s): 1OM-34.2.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-34.1 Objective 10 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
		008K3.03	
	Importance Rating	4.1	

Knowledge of the effect that a loss or malfunction of CCWS will have on the following: RCPs

Proposed Question: RO 90

Given the following conditions:

- The Unit is in Mode 3. All systems are in NSA.
- The following annunciator is received in the Control Room:
  - [A3-73], REACT COOL PP THERMAL BARRIER COOL WATER DISCH FLOW HIGH
- [TV-1CC-107A], RCP Thermal Barrier CCR Outlet Isolation Valve is closed.

Which one of the following describes the effect of this failure on the operation of "1A" RCP?

A. "1A" RCP must be tripped immediately.

B. [TV-1CC-107A] must be opened within 5 minutes or "1A" RCP must be tripped.

C. "1A" RCP must be tripped within 5 minutes regardless of [TV-1CC-107A] position.

D. "1A" RCP must be tripped ONLY if seal injection is also lost for greater than 5 minutes.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. No reason to trip immediately, such as temperature problems, etc.
B. Incorrect. Attempt to reopen valve, but pump may operate indefinitely with seal injection and stable temperatures.
C. Incorrect. Pump must only be tripped if seal injection not available.
D. Correct.

Technical Reference(s): 1OM-6.4.AAH (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-6.3 Objective 21 (As available)

Question Source: Bank # 1LOT4 NRC #83
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: 1LOT4 NRC #83

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
		G2.4.18	
	Importance Rating	2.7	

Knowledge of specific bases for EOPs

Proposed Question: RO 91

Given the following:

- The reactor has failed to trip automatically when required and cannot be manually tripped.
- The main turbine is tripped.
- All AFW pumps are running.
- Emergency boration is in progress.
- PRZR pressure is 2335 psig.
- The PRZR PORV's do not automatically open.
- The operators manually open one PRZR PORV and reduce RCS pressure to 2135.

Which one of the following is the reason for reducing RCS pressure at this point in the transient?

A. To prevent the rapid RCS overpressurization transient expected with most ATWS events.

B. To minimize primary-to-secondary leakage until further recovery actions can be taken in the case of the most limiting ATWS event, a SGTR.

C. To allow enough borated flow into the RCS to ensure the addition of negative reactivity to the core.

D. To add negative reactivity from the RCS pressure coefficient of reactivity as the RCS is depressurized.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. At this point the overpressure condition has already occurred.
B. Incorrect. High DP may increase possibility of SGTR, but is not the reason for reducing RCS pressure on PORV failure.

C. Correct. Lower pressure, more flow from charging.
D. Incorrect. Reactivity effect is negligible for the 200 psi pressure difference, and that effect is not considered in the EOP development.

Technical Reference(s): 1OM-53B.4-FR-S.1 (Attach if not previously provided)
FR-S.1 Step 8

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: 2LOT3 NRC Question #99

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
		G2.4.46	
	Importance Rating	3.5	

Ability to verify that the alarms are consistent with the plant conditions.

Proposed Question: RO 92

An alarm is received in the Control Room. The instrument that feeds the alarm also feeds a system control action.

The crew believes that a false indication has caused the alarm.

Which one of the following describes the required response to the indication?

A. Do not believe the alarm indication. If the control action is in the conservative direction, no action is necessary. If the control action may result in a plant trip, take manual control of the system.

B. Believe the alarm indication. If the control action is in the conservative direction, no action is necessary unless the instrument or alarm is determined to be false by at least two independent crew members.

C. Do not believe the alarm indication. Place the affected controller in manual and determine which failure has occurred in accordance with the Annunciator Response Procedure.

D. Believe the alarm indication. If the control action is in a conservative direction, no action is necessary unless two redundant instruments monitoring the same parameter determine that the control action is being caused by a failed instrument.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Believe indication until proven otherwise.
B. Incorrect. Two instruments, not two crew members required.
C. Incorrect. Believe indication until proven otherwise.
D. Correct.

Technical Reference(s): 1/2 OM-48.1.D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-48.1 Objective 7.d (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
		G2.4.5	
	Importance Rating	2.9	

Knowledge of the organization of the operating procedures network for normal, abnormal and emergency evolutions.

Proposed Question: RO 93

The crew is performing a Unit startup in accordance with 1OM-52.4.A, Raising Power From 5% To Full Load Operation.

A loss of instrument air occurs. Feedwater control is lost and the reactor is tripped.

Which one of the following describes the appropriate procedure usage for this event?

A. OM-52.4.A and AOP usage must be suspended while performing the EOPs.

B. OM-52.4.A usage is suspended. AOP usage is only allowed in RED or ORANGE Path Function Recovery Procedures.

C. OM-52.4.A usage is suspended. AOP usage is allowed if actions assist with the intention of the EOP in use.

D. OM-52.4.A and AOP usage is allowed as long as their performance does not interfere with actions of the EOPs.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. If an AOP is helpful to completion of EOP tasks, it may be used.
B. Incorrect. Normally Red or Orange Path procedures are performed without other procedures. AOP usage would not be allowed.
C. Correct.
D. Incorrect. OM use is suspended and AOP use is only allowed if actions are consistent with EOP intent.

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

_____

_____

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Group #		
		G2.4.31	
	Importance Rating	3.3	

Knowledge of annunciators, alarms and indications, and use of the response instructions.

Proposed Question: RO 94

When responding to multiple annunciators in the Control Room, which one of the following annunciator groupings and/or response procedures has the highest priority?

A. First Out

B. RPS/ESF

C. Vital Busses

D. Imminent Equipment Damage

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. Of the 4, first out is highest priority.
C. Incorrect. Vital busses below RPS signals.
D. Incorrect. Below all others in above list.

Technical Reference(s): 1/2 OM-48.2.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-48.1 Objective 13 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E09EK2.1	
	Importance Rating	3.2	

Knowledge of the interrelations between the (Natural Circulation Operations) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Proposed Question: RO 95

Given the following conditions:

- A reactor trip has occurred due to a loss of offsite power.
- The crew is performing actions of ES-0.2, Natural Circulation Cooldown.
- RVLIS is NOT available.
- The crew has commenced RCS depressurization to 1950 psig.
  - RCS pressure is 2080 psig and trending DOWN.
  - RCS Tavg is 548°F and STABLE.
  - Pressurizer Level is 5% and trending DOWN.

Which one of the following actions will be required?

A. Continue depressurization to 1950 psig and block SI.

B. Initiate Safety Injection and go to E-0, Reactor Trip Or Safety Injection.

C. Stop the cooldown, Block SI, and initiate depressurization to 1950 psig.

D. Stop the depressurization and go to ES-0.4, Natural Circulation With Steam Void in Vessel, (Without RVLIS).

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Continuous Action requires SI initiation.
B. Correct.
C. Incorrect. SI blocked when 1950 psig is reached.
D. Incorrect. If steam voids were formed, they would cause pressurizer level to rise, not drop.

Technical Reference(s): ES-02, Symptomatic Response/Unexpected Conditions (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.1 Objective 1a (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E10EA2.2	
	Importance Rating	3.4	

Ability to determine and interpret the following as they apply to the (Natural Circulation with Steam Void in Vessel with/without RVLIS): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: RO 96

Given the following conditions:

- The reactor has tripped due to a loss of offsite power.
- The crew has transitioned to ES-0.3, Natural Circulation Cooldown With Steam Void in Vessel (With RVLIS) due to steam void formation in the reactor vessel.

While performing this procedure, which one of the following conditions requires the crew to stop the cooldown and raise RCS pressure?

A. Pressurizer level rises to 90%.

B. RVLIS Dynamic Range indication drops below 100%.

C. RCS cooldown cannot be maintained less than 25°F/Hr.

D. RVLIS Full Range indication drops below 77%.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. PRZR level is expected to rise. Action is taken to limit the rise, but pressure is maintained stable until other action reduces level.

B. Incorrect. Dynamic Range is used when RCPs are running.

C. Incorrect. The rate exceeding 25 deg F/hr is one of the entry conditions to the procedure used. The limit in ES-0.3 is 100 deg F/hr.

D. Correct. Full Range < 77% can lead to core uncovery if trend continues.

Technical Reference(s): ES-0.3 step 6 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3, Objective 3 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E12G2.1.27	
	Importance Rating	2.8	

Conduct of Operations: Knowledge of system purpose and or function.

Proposed Question: RO 97

The Unit was at 100% power when the following occurs:

- Reactor trip, all rods fully inserted.
- Loop 1 SG pressure is 400 psig and continuing to lower rapidly.
- Loop 2 and 3 SG pressures are stable at 800 psig.
- Containment pressure is 12 psig and rising.

Which one of the following describes the valves that are needed to operate to terminate steam flow?

A. The "A" Main Steam Isolation Valve [TV-1MS-101A] or Non-Return Valve [NRV-1MS-101A].

B. The "A" Main Steam Isolation Valve [TV-1MS-101A] or Non-Return Valves [NRV-1MS-101B and C].

C. The "B" and "C" Main Steam Isolation Valves [TV-1MS-101B and C] or Non-Return Valve [NRV-1MS-101A].

D. The "B" and "C" Main Steam Isolation Valves [TV-1MS-101B and C] or Non-Return Valves [NRV-1MS-101B and C].

Proposed Answer: C

Explanation (Optional):

A. Incorrect. "A" MSIV will not stop flow in the reverse direction.
B. Incorrect. "A" MSIV will not stop flow in the reverse direction.
C. Correct. The Main Steam Isolation Valves and the Non-return Valves are standard wing check valves in a common body; except, the Main Steam Isolation Valves (Trip Valves) are installed counter to normal flow. The Main Steam Isolation Valves are normally held out of the steam flow path. For the plant conditions provided, a Loop 1 steam Line isolation signal is generated by the Loop 1 steam line pressure low (< 500 psig); however, the break is indicated upstream of TV-1MS-101A, resulting in reverse flow through the Loop 1 Main Steam Isolation Valve and Non-return Valve. Therefore, TV-1MS-101A will not shut to halt steam flow; however, NRV-1MS-101A should shut to halt

steam flow. If the Non-return Valve [NRV-1MS-101A] does not immediately halt steam flow, a high containment pressure condition (> 3 psig) will provide an isolation signal to all of the Main Steam Isolation Valves, and the B and C Main Steam Isolation Valves [TV-1MS-101B and C] would be allowed to shut due to high steam flow in the forward direction.

D. Incorrect. SG "B" and "C" NRVs will allow steam flow in the forward direction.

Technical Reference(s): 1OM-21.1D (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-21.1 Objective 3 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:
Candidate must determine location of break, actuations present, and operation of valves to isolate flow.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	E08EK3.4	
	Importance Rating	3.4	

Knowledge of the reasons for the following responses as they apply to the (Pressurized Thermal Shock): RO or SRO function as a within the Control Room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.

Proposed Question: RO 98

Following a Small Break LOCA, the crew is performing action contained in FR-P.1, Response To Imminent Pressurized Thermal Shock.

Which one of the following describes the difference in SI Termination Criteria for FR-P.1 as opposed to the criteria in ES-1.1, Safety Injection Termination?

The criterion in FR-P.1 is...

A. less restrictive to allow for a faster reduction in RCS pressure.

B. more restrictive to allow for a more controlled reduction in RCS pressure.

C. less restrictive because subsequent RCP restart is likely to cause propagation of any existing flaw in the reactor vessel walls.

D. more restrictive because subsequent RCP restart is likely to cause propagation of any existing flaw in the reactor vessel walls.

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. Not more restrictive since the objective is to immediately reduce pressure to reduce risk of vessel failure.
C. Incorrect. RCP restart will not cause crack propagation under any proposed circumstances.
D. Incorrect. RCP restart will not cause crack propagation under any proposed circumstances.

Technical Reference(s): FR-P.1 Background (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # X(Vendor Bank)
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
		E14EA1.2	
	Importance Rating	3.3	

Ability to operate and/or monitor the following as they apply to the (High Containment Pressure): Operating behavior characteristics of the facility.

Proposed Question: RO 99

The Unit was operating at 100% power when a Small Break LOCA in containment resulted in a reactor trip and safety injection actuation.

Which one of the following describes the expected SEQUENCE of automatic actions as containment pressure increases, peaking at 11 psig?

A. CIB initiated; Main Steamlines isolated; Recirc Spray Pumps started.

B. CIB initiated; Recirc Spray Pumps started; Main Steamlines isolated.

C. Main Steamlines isolated; CIB initiated; Recirc Spray Pumps started.

D. Main Steamlines isolated; Recirc Spray Pumps started; CIB initiated.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Steam Line isolation is at a lower pressure than CIB.
B. Incorrect. Steam Line Isolation is at a lower pressure than CIB.
C. Correct. Main Steam Line Isolation occurs at 3 psig. CIB occurs at 8 psig. Recirc Spray Pumps auto start 210 seconds (1RS-P-1A, 2B) and 225 seconds (1RS-P-1B, 2A) after the CIB signal is received.
D. Incorrect. CIB before Recirc Spray.

Technical Reference(s): Attachment 1K (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 4 (As available)

Question Source: Bank #

Modified Bank # _____ (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
		E06EK1.2	
	Importance Rating	3.5	

Knowledge of the operational implications of the following concepts as they apply to the (Degraded Core Cooling): Normal, abnormal and emergency operating procedures associated with (Degraded Core Cooling).

Proposed Question: RO 100

Given the following conditions:

A LOCA has occurred. Due to ECCS failures, the crew is performing actions contained in FR-C.2, Response To Degraded Core Cooling.

The crew is depressurizing steam generators to facilitate SI accumulator injection.

Which one of the following Critical Safety Functions could potentially exhibit a RED condition based upon the action taken in FR-C.2?

A. Subcriticality

B. Core Cooling

C. Heat Sink

D. Integrity

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Positive reactivity will be added by the cooldown but not expected to be enough to cause red path.
B. Incorrect. Current condition may worsen to red condition but not due to actions taken in FR-C.2.
C. Incorrect. Adequate feed flow should keep Heat Sink out of red path.
D. Correct. Tcold cooldown rate will be exceeded and minimum temperature may also be exceeded. Expected to possibly turn Integrity red path.

Technical Reference(s): FR-C.2 Caution prior to step 13 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.1 Objective 2 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

U. S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information	
Name:	Region: I
Date:	Facility/Unit: BVPS-1
License Level: **SRO**	Reactor Type: Westinghouse PWR
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected six hours after the examination starts.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results

Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

BVPS Unit 1 Senior Reactor Operator (2002-01)
Answer Key

1.	C	26.	A	51.	C	76.	C
2.	C	27.	A	52.	A	77.	A
3.	A	28.	B	53.	A	78.	A
4.	B	29.	B	54.	C	79.	A
5.	A	30.	B	55.	A	80.	B
6.	A	31.	B	56.	A	81.	C
7.	C	32.	B	57.	C	82.	B
8.	A	33.	B	58.	C	83.	B
9.	B	34.	D	59.	B	84.	B
10.	A	35.	A	60.	B	85.	B
11.	D	36.	B	61.	A	86.	B
12.	D	37.	C	62.	B	87.	B
13.	A	38.	B	63.	B	88.	A
14.	C	39.	C	64.	C	89.	A
15.	B	40.	A	65.	B	90.	C
16.	B	41.	B	66.	B	91.	C
17.	A	42.	B	67.	C	92.	A
18.	D	43.	C	68.	C	93.	A
19.	D	44.	B	69.	A	94.	B
20.	C	45.	A	70.	D	95.	A
21.	B	46.	D	71.	D	96.	C
22.	B	47.	A	72.	C	97.	C
23.	C	48.	B	73.	C	98.	C
24.	B	49.	C	74.	B	99.	C
25.	A	50.	B	75.	C	100.	B

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		001K4.17	
	Importance Rating	2.9	3.1

Knowledge of CRDS design feature(s) and/or interlock(s), which provide for the following: Override (bypass) for rod bank motion when one rod is bottomed.

Proposed Question: Common 1

Given the following conditions:

- The Unit is at 85% power. All systems are in NSA.
- A Control Bank "D", Group 2 rod drops to the bottom of the core.
- The plant is stabilized, the cause of the failure identified and repaired.

Which one of the following describes the method for retrieving the dropped rod in accordance with 1OM-1.4.X, RCCA or RCCA Group Misalignment?

A. All rods in group 2 except the affected rod are disconnected. Control Bank "D", Group 1 rods remain connected. The Group 2 Step Counter is set to the dropped rod position prior to retrieval. The affected rod is withdrawn until the Group 2 Step Counter matches the Group 1 Step Counter.

B. All rods in Control Bank "D", Group 1 and Group 2, except the affected rod are disconnected. The Step Counter for Group 2 is set to the dropped rod position. The Step Counter for Group 1 is left at its current position. The affected rod is withdrawn until Group 1 and Group 2 Demand are equal.

C. All rods in Control Bank "D", Group 1 and Group 2, except the affected rod are disconnected. The Step Counters for Group 1 and Group 2 are set to the dropped rod position. The affected rod is withdrawn until the Step Counters match the initial bank position.

D. All rods in group 2 except the affected rod are disconnected. Control Bank "D", Group 1 rods remain connected. The Step Counters for Group 1 and Group 2 are set to the dropped rod position. The affected rod is withdrawn until the Step Counters match the initial bank position.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. All CB D rods are disconnected except affected rod, to prevent other bank

movement. Both step counters are dialed to dropped rod position.
B. Incorrect. Group 2 step counters are also placed at the dropped rod position.
C. Correct.
D. Incorrect. All CB D rods disconnected, both groups.

Technical Reference(s): 1OM-1.4.X (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53.C.1 Objective 5 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		001K3.01	
	Importance Rating	2.9	3.0

Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: CVCS

Proposed Question: Common 2

The Unit is operating at 100% power, NSA when the following indications are observed.

- Control Bank "D" Rod F-6 position indicates '0' steps.
- Rod bottom rod drop alarm is received.

If rod F-6 is the only rod bottom light lit and the Unit remains on-line, which one of the following describes the INITIAL automatic response of the CVCS system?

A. Letdown flow is increased.

B. Letdown flow is decreased.

C. Charging flow is increased.

D. Charging flow is decreased.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Letdown flow passes through a restricting orifice, which maintains letdown flow essentially constant.
B. Incorrect. Letdown flow passes through a restricting orifice, which maintains letdown flow essentially constant.
C. Correct. When the control rod is dropped, Rx power will decrease, and with turbine load initially unaffected, RCS T_{avg} will lower. As RCS T_{avg} drops, PRZR level will decrease, and charging flow will increase as a result.
D. Incorrect. When the control rod is dropped, Rx power will decrease, and with turbine load initially unaffected, RCS T_{avg} will lower. As RCS T_{avg} drops, PRZR level will decrease, and charging flow will increase as a result.

Technical Reference(s): AOP-1.1.8 (Attach if not previously provided)
1OM-7.1.C

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-7.1 Objective 21 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		003A2.02	
	Importance Rating	3.7	3.9

Ability to (a) predict the impacts of the following malfunctions or operations on the Reactor Coolant Pump System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP

Proposed Question: Common 3

Given the following conditions:

- The Unit is in Mode 3.
- A reactor startup is in progress.
- Shutdown Bank "A" is fully withdrawn.
- Shutdown Bank "B" is being withdrawn.
- The following annunciator is received in the control room:
  - [A3-82], REACTOR COOL PP BRG OIL RESERVOIR LOW
- The startup is stopped while a containment entry is made to investigate.

The operator in containment reports a large oil leak in the vicinity of 1A RCP, and recommends tripping the pump.

Which one of the following describes the action required?

A. Trip 1A RCP and refer to the Alarm Response Procedure for 1A RCP Low Flow.

B. Trip the reactor, trip 1A RCP, and refer to the Alarm Response Procedure for 1A RCP Low Flow.

C. Trip the reactor, perform Immediate Operator Actions of E-0, Reactor Trip or Safety Injection, trip 1A RCP, and continue in E-0.

D. Monitor 1A RCP bearing temperatures. If any bearing temperature exceeds 275°F, trip the RCP and refer to the alarm response procedure for RCP Bearing High Temperature.

Proposed Answer: A

Explanation (Optional):

A. Correct. No action required for reactor trip or shutdown because the plant is already in Mode 3.
B. Incorrect. Reactor Trip not required. Subcritical withdrawing SD banks.
C. Incorrect. Reactor trip not required. E-0 entry not required.
D. Incorrect. Do not allow bearing temperatures to exceed alarm setpoint of 185°F.

Technical Reference(s): 1OM-6.4.AAI (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-6.3 Objective 21 (As available)

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

Question History: 1LOT4 NRC Question #55

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	003A3.05	
	Importance Rating	2.7	2.6

Ability to monitor automatic operation of the RCPs, including: RCP lube oil and bearing lift pumps.

Proposed Question: Common 4

The following conditions exist for starting a Reactor Coolant Pump (RCP):

- Local Lift Oil Pump control switch in AUTO
- RCP control switch placed in START and released.

Which one of the following describes the sequence of events that will take place to start the RCP?

A. Lift Oil Pump starts. After 50 seconds, RCP starts. 2 minutes later the Lift Oil Pump stops.

B. Lift Oil Pump starts. After 2 minutes, RCP starts. 50 seconds later the Lift Oil Pump stops.

C. After 50 seconds the Lift Oil Pump starts. 2 minutes later the RCP starts. 50 seconds, the Lift Oil Pump stops.

D. After 50 seconds the Lift Oil Pump starts. After 50 seconds the RCP starts. 2 minutes later the Lift Oil Pump stops.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. RCP timer and lift pump timer are reversed.
B. Correct.
C. Incorrect. No time delay for Oil Lift Pump.
D. Incorrect. No time delay for Oil Lift Pump and timers reversed for RCP and oil lift pump.

All plausible because each distractor starts Lift Pump first. Candidate must know timers.

Technical Reference(s): **RCS Logic diagrams LSK-25-1A & 1B** (Attach if not previously provided)
1OM-6.4A

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-6.3-09 (As available)

Question Source: Bank # _____
Modified Bank # 1SQS-6.3-09-01 (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		004K1.06	
	Importance Rating	3.1	3.1

Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: Makeup system to VCT.

Proposed Question: Common 5

The Unit is operating at 100% power NSA, when the [LT-1CH-112] VCT Level Transmitter fails high.

After an extended period of operation, the following conditions result.

- [A3-53], VOLUME CONTROL TANK LEVEL HIGH-LOW alarms
- VCT level indicates approximately 5%.

Assuming no action by the crew, which one of the following describes the expected automatic plant response?

A. Charging pump suctions from the VCT remain open; the charging pumps will eventually lose suction because the RWST suction valves remain closed.

B. Charging pump suctions from the VCT will close; the charging pumps will lose suction because the RWST suction valves remain closed.

C. Charging pump suctions from the VCT remain open; the charging pumps will continue to operate normally because the RWST suction valves also open on Low VCT level.

D. Charging pump suctions from the VCT will close; the charging pumps will continue to operate normally because the RWST suction valves open on low VCT level.

Proposed Answer: A

Explanation (Optional):

A. Correct. As a result of this failure, level control valves [LCV-1CH-115A] and [LCV-1CH-112] modulate open, diverting flow to the boron recovery system; thus, actual VCT level will lower. [LT-1CH-115] provided the VCT Hi-Lo level alarm and the control room indication that VCT level is 5%. However, because both LT-1CH-112 and LT-1CH-115 must sense level at 5% for the automatic transfer of the charging pump suctions to the RWST to occur, the charging pumps will remain aligned to the VCT, eventually losing pump suction.
B. Incorrect. 2/2 level transmitters required for any swapover function.
C. Incorrect. 2/2 level transmitters required for swapover functions.
D. Incorrect. Description of 2/2 level transmitters below 5%. LT-112 is still failed high.

Technical Reference(s): 1OM-7.4.AAX (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-7.1 Objective 17 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		004K5.08	
	Importance Rating	2.6	3.2

Knowledge of the operational implications of the following concepts as they apply to the CVCS: Estimation of subcritical multiplication factor (K-eff) by means other than the 6-factor formula: relationship of count rate changes to reactivity changes.

Proposed Question: Common 6

The crew is performing a dilution in preparation for rod withdrawal to criticality.

If Keff is approximately .99 when the dilution is started, at what point in the dilution can the crew determine that Keff is approximately .995?

A. When the Source Range counts double from their initial value.

B. When there is a stable startup rate with no change in the dilution flow rate.

C. When Control Bank 'A' control rods are withdrawn from the core.

D. When the Source Range counts double 2 - 3 times from their initial value.

Proposed Answer: A

Explanation (Optional):

A. Correct. Rule of thumb, double counts, half way to critical.
B. Incorrect. Partial description of criticality.
C. Incorrect. Although TS Mode 2 is Keff > .99, that is not the correct way to estimate half way to critical.
D. Incorrect. Based upon the thumb rule that 5 - 6 doublings make the reactor critical, this distractor cuts that value in half for half way to critical.

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

_____

_____

Proposed References to be provided to applicants during examination: NONE

Learning Objective: Generic Fundamentals (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		061A1.01	
	Importance Rating	3.9	4.2

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: S/G level

Proposed Question: Common 7

Given the following conditions:

- An ATWS has occurred.
- The crew is performing the actions of FR-S.1, Response to Nuclear Power Generation/ATWS.
- All steam generator narrow range levels are off-scale LOW.

Which one of the following describes the required operation of the AFW system, and why?

A. Operate all available AFW pumps to establish total flow of 355 gpm; to maintain minimum heat sink and restore SG levels.

B. Operate motor driven AFW pumps only to establish total flow of 355 gpm; to minimize effects of RCS cooldown on reactivity.

C. Operate all available AFW pumps to establish total flow of 630 gpm; to maintain minimum heat sink and restore SG levels.

D. Operate motor driven AFW pumps only to establish total flow of 630 gpm; to minimize effects of RCS cooldown on reactivity.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. 355 normal AFW minimum. 630 required if SG levels < 13%.
B. Incorrect. All pumps operated. Reason is wrong for plant conditions. Value is wrong for plant conditions.
C. Correct. Operate 3 pumps at a flow of 630 gpm to maintain secondary inventory.
D. Incorrect. Operate all 3 pumps. Reason is wrong, but would be valid for a situation where FR-S.1 is entered later in an event due to cooldown, where the 630 gpm flow limit

does not apply because SG levels may already be established. In that case, additional AFW flow would make the problem worse.

Technical Reference(s): FR-S.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		013A4.01	
	Importance Rating	4.5	4.8

Ability to manually operate and/or monitor in the control room: ESFAS initiated equipment which fails to actuate

Proposed Question: Common 8

Given the following conditions:

- The Unit was operating at 100% power.
- A PORV failed open.
- The reactor has tripped on low pressurizer pressure.
- Pressurizer pressure stabilizes at 1700 psig.

Plant status is as follows:

- All control rods are fully inserted.
- Status light "S Inj Act Sig" not LIT at Panel 62, C-4.
- Normally running Charging pump is in service.
- Standby Charging pump not running,
- No LHSI pumps running.
- CIA not actuated.
- CIB not actuated.
- Main Steam Lines not isolated.
- Feedwater Isolation not actuated.

Which one of the following describes the required manual operator actions?

Manually initiate both trains of ...

A. Safety Injection.

B. Safety Injection and CIB.

C. Safety Injection, CIB, and Main Steam Line Isolation.

D. Safety Injection, CIB, Main Steam Line Isolation, and CIA.

Proposed Answer: A

Explanation (Optional):

A. Correct. When PRZR pressure drops below 1845 psig SIS should have actuated, which would result in Safety Injection, CIA, and feedwater isolation. Manual actuation of SI should start the non-running HHSI and LHSI pumps as well as actuate CIA and the Feedwater

Isolation.
B. Incorrect. CIB is not actuated on low PRZR pressure.
C. Incorrect. CIB and MSL Isolation are not actuated on low PRZR pressure.
D. Incorrect. CIB and MSL Isolation are not actuated on low PRZR pressure. CIA will actuate when SI is initiated.

Technical Reference(s): E-0 (Attach if not previously provided)
Att 1-K
1OM-1.2B

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 10 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	015K5.02	
	Importance Rating	2.7	2.9

Knowledge of the operational implications of the following concepts as they apply to the NIS: Discriminator/compensation operation.

Proposed Question: Common 9

Which one of the following contains BOTH conditions that will result in indicated reactor power being LOWER than actual reactor power?

A. Source Range pulse height discrimination set too LOW
Intermediate Range Compensating voltage set too LOW

B. Source Range pulse height discrimination set too HIGH
Intermediate Range Compensating voltage set too HIGH

C. Source Range pulse height discrimination set too LOW
Intermediate Range Compensating voltage set too HIGH

D. Source Range pulse height discrimination set too HIGH
Intermediate Range Compensating voltage set too LOW

Proposed Answer: B

Explanation (Optional):

A. Incorrect. If pulse height discrimination is set too low, then more gamma pulses will be counted, resulting in an indicated reading higher than actual. If IR compensating voltage is set too low, the detector will have a higher output, resulting in a higher power indication.
B. Correct.
C. Incorrect. See explanation for 'A' above.
D. Incorrect. See explanation for 'A' above.

Technical Reference(s): 1OM-2.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1, Objective 2.c (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	015A3.01	
	Importance Rating	3.8	3.8

Ability to monitor automatic operation of the NIS, including: Console and cabinet indications.

Proposed Question: Common 10

Following a Unit trip, Intermediate Range Startup rate is approximately -1/3 decade per minute on both channels.

Current indication on Intermediate Range channels are as follows:

- N35 = $5E^{-7}$ amps
- N36 = $2E^{-8}$ amps

Based upon the above indications, which one of the following describes the expected sequence for Source Range channel N31 and N32 energization?

A. Both Source Range channels will energize when N35 reaches its setpoint

B. Both Source Range channels will energize when N36 reaches its setpoint

C. N31 will energize when N35 reaches its setpoint. N32 will energize when N36 reaches its setpoint

D. N31 will energize when N36 reaches its setpoint. N32 will energize when N35 reaches its setpoint

Proposed Answer: A

Explanation (Optional):

A. Correct. N35 reads higher, so at the same startup rate, it will take longer to reach the SR energization setpoint of 10-10 amps.
B. Incorrect. 2 out of 2 required to energize SR instruments.
C. Incorrect. SR not off individual detectors, they are energized based on permissive.
D. Incorrect. SR not off individual detectors, they are energized based on permissive.

Technical Reference(s): 1OM-2.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-2.1 Objective 8 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
		014A4.01	
	Importance Rating	3.3	3.1

Ability to manually operate and/or monitor in the Control Room: Rod selection control.

Proposed Question: Common 11

Given the following conditions:

- The Unit is in Mode 1. All systems are in NSA.
- All Tavg channels are approximately 3°F higher than Tref.

Which one of the following modes on the Rod Control System Mode Selector Switch will provide the FASTEST rod speed if rod motion is demanded?

A. Manual

B. Automatic

C. Control Bank 'A'

D. Shutdown Bank 'A'

Proposed Answer: D

Explanation (Optional):

A. Incorrect. 48 spm.
B. Incorrect. 3 degree mismatch will move bank 'D' rods at approximately 40 spm (8 - 72 spm band).
C. Incorrect. 48 spm.
D. Correct. 64 spm, is adjustable.

Technical Reference(s): 1OM-1.2.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1C Objective 10 (As available)

Question Source: Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: 3SQS-1.3-010-1

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		017K1.01	
	Importance Rating	3.2	3.2

Knowledge of the physical connections and/or cause effect relationships between the ITM system and the following systems: Plant computer.

Proposed Question: Common 12

Given the following conditions:

- Reactor trip has occurred from 100% power.
- Actions of E-0, Reactor Trip or Safety Injection, are being performed.
- The crew is checking if SI flow should be terminated when it is determined that RCS subcooling on ICCM is less than the required 43°F.

With subcooling on ICCM less than the required 43°F, the crew is required to check RCS subcooling based on core exit TCs.

Which one of the following describes the method used to determine whether RCS subcooling is adequate?

A. Minimum required subcooling is determined using the SPDS; actual RCS subcooling is calculated by the IPC.

B. Actual RCS subcooling is determined using Main Control board indications; minimum required subcooling is determined by the SPDS.

C. Minimum required subcooling is determined using an EOP Attachment; RCS subcooling is determined using Main Control Board indications.

D. RCS subcooling is determined using the SPDS; minimum required subcooling is determined using an EOP attachment.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Required subcooling determined by Attachment 6-A.
B. Incorrect. No CETs on Main Control Board.
C. Incorrect. No CETs on Main Control Board.
D. Correct. RCS subcooling can be read on the IPC. Minimum required subcooling is determined using EOP attachment 6-A, 0°F plus Subcooling Based on Core Exit TCs.

Technical Reference(s): E-0
Attachment 6-A
1OM-3.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		022K4.04	
	Importance Rating	2.8	3.1

Knowledge of Containment Cooling System design features and/or interlocks which provide for the following: Cooling of Control Rod Drive Motors

Proposed Question: Common 13

Which one of the following correctly completes the following description of CRDM Shroud Cooling Fan operation?

With all plant systems in their normal alignments, [1VS-F-2C], CRDM Shroud Fan would start in the _____ if [1VS-F-2A], CRDM Shroud Fan is not racked in on bus _____, and the diesel loading sequence signal is received.

A. auto mode; 8N

B. auto mode; 8P

C. manual mode; 8N

D. manual mode; 8P

Proposed Answer: A

Explanation (Optional):
A. Correct. 2C will start if 2A not available, 2C in auto, and DG sequence signal received.
B. Incorrect. Wrong bus.
C. Incorrect. Wrong mode.
D. Incorrect. Wrong mode and wrong bus.

Technical Reference(s): 1OM-44C.1.E (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-44.C.1 Objective 4 (As available)

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

New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
		022A1.01	
	Importance Rating	3.6	3.7

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

Proposed Question: Common 14

Given the following conditions:

- A Loss of Off-Site power has occurred.
- All equipment has started and is operating as designed.

Which one of the following describes how Containment temperature is controlled under these conditions?

A. All Containment Air Recirculation Fans automatically sequence onto the EDGs.

B. Containment Air Recirculation Fans will automatically start when their control switches are placed in 'AUTO AFTER STOP'.

C. Containment Air Recirculation Fans must be manually started as necessary to control Containment temperature.

D. Containment Air Recirculation Fans 'A' and 'B' automatically sequence onto the EDGs. Fan 'C' must be manually started on the bus it is aligned to.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. No sequence on Loss of Power.
B. Incorrect. No Auto operation to start fans is available.
C. Correct.
D. Incorrect. Fan 'C' is a swing fan for either bus. None of the fans will auto start, but 'C' will start in manual.

Technical Reference(s): 1OM-44.C.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1OM-44.C.1 Objective 13 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
		026K2.02	
	Importance Rating	2.7	2.9

Knowledge of bus power supplies to the following: MOVs.

Proposed Question: Common 15

The Unit is operating at 80% power. All systems are in NSA.

Smoke is detected in the vicinity of MCC1-E5, and as a result, MCC1-E5 is deenergized.

Subsequently, a LOCA inside Containment results in a Reactor Trip, Safety Injection, and Containment Spray Actuation.

Which one of the following describes the response of the Quench Spray System?

Quench Spray Pump...

A. "A" starts and injects. "B" starts but does not provide spray flow.

B. "B" starts and injects. "A" starts but does not provide spray flow.

C. "A" and "B" both start, but neither train provides spray flow.

D. "A" and "B" both start, and both trains provide spray flow.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Wrong train.
B. Correct. MCC1-E5 powers the "A" Quench Spray Pump Discharge Valve [MOV-1QS-101A]. MOV-1QS-101A is normally closed and auto opens in the event of a CIB initiation signal. With MCC1-E5 deenergized, MOV-1QS-101A cannot open; therefore, Quench Spray Pump "A" does not inject. Both Quench Spray Pumps and the "B" Quench Spray Pump Discharge Valve [MOV-1QS-101B] are unaffected when MCC1-E5 is deenergized.
C. Incorrect. Train 'B' injects.
D. Incorrect. Train 'A' does not provide spray flow.

Technical Reference(s): 1OM-13.3.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-13.1 Objective 19 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
		026A4.05	
	Importance Rating	3.5	3.5

Ability to manually operate and/or monitor in the Control Room: Containment spray reset switches.

Proposed Question: Common 16

Given the following conditions:

- A LOCA has occurred
- The following Safeguards actuations have initiated:
  - SI
  - CIA
  - CIB
  - MSLI
- All equipment is operating as designed.

Which one of the following describes the manipulations necessary to allow stopping a Quench Spray Pump?

A. Reset SI only.

B. Reset CIB only.

C. Reset SI and CIA. (Both required)

D. Reset SI, CIA, and CIB. (All required)

Proposed Answer: B

Explanation (Optional):

A. Incorrect. QSS does not start on SI.
B. Correct.
C. Incorrect. Neither SI nor CIA are in the start circuit for QSS.
D. Incorrect. Neither SI nor CIA are in the start circuit for QSS.

Technical Reference(s): 1OM-13.1.C (Attach if not previously provided)

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Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-13.1 Objective 17 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		002A1.13	
	Importance Rating	3.4	4.0

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCS controls including: Core exit thermocouples.

Proposed Question: Common 17

Given the following conditions:

- Following a reactor trip due to a complete loss of CCR, all reactor coolant pumps are stopped.
- All systems are operating as designed.

Which one of the following describes the expected response of the core exit thermocouples following trip of the RCPs?

Core exit temperature initially _____ and then _____.

A. rises; drops

B. drops; rises

C. rises; stabilizes

D. drops; stabilizes

Proposed Answer: A

Explanation (Optional):

A. Correct. Core exit temperature initially rises when the RCPs are stopped due to less flow through the core. As natural circulation flow is established, core exit temperature will then lower as core Delta-T lowers. Delta-T is lowering because decay heat load is also lowering. Tcold will stay at steam dump pressure setpoint, so Delta-T drops by Thot and CETs dropping.
B. Incorrect. CETs rise for a period following the trip.
C. Incorrect. CETs do not stabilize if all systems operate as designed. They will drop because of steam dump load and decay heat.
D. Incorrect. CETs do not drop when RCPs are tripped.

Technical Reference(s): Simulator Response (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-3.1 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		006K6.05	
	Importance Rating	3.0	3.5

Knowledge of the effect of a loss or malfunction of the following will have on the ECCS: HPI/LPI cooling water.

Proposed Question: Common 18

With the Unit operating at 80% power, with all systems in NSA, the [1WR-P-1A], Reactor Plant River Water Pump trips.

Which one of the following describes the operational impact on the ECCS?

Reactor Plant River Water is available to the...

A. "B"LHSI pump [1SI-P-1B] only.

B. "B" HHSI Pump [1CH-P-1B] only.

C. "A"LHSI pump [1SI-P-1A] and the "B"LHSI pump [1SI-P-1B].

D. "A" HHSI Pump [1CH-P-1A] and the "B" HHSI Pump [1CH-P-1B].

Proposed Answer: D

Explanation (Optional):

A. Incorrect. River water does not cool LHSI Pumps.
B. Incorrect. Both river water headers supply each HHSI Pump.
C. Incorrect. River water does not cool LHSI Pumps.
D. Correct. Both river water headers supply each HHSI Pump.

Technical Reference(s): 1OM-7.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-11.1 Objective 15 (As available)

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

New: X

Question History:

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

10 CFR Part 55 Content: 55.41: X
55.43:

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		006A1.14	
	Importance Rating	3.6	3.9

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: Reactor vessel level.

Proposed Question: Common 19

Given the following conditions:

- A LOCA has occurred.
- The crew is performing actions of ES-1.2, Post LOCA Cooldown and Depressurization.
- Pressurizer level is stable at 58%.
- RCS Pressure is stable at 1680 psig.
- The US determines that a Charging/HHSI pump can be stopped in accordance with Attachment 7-A, Criteria For Stopping 1 of 2 Running Charging/HHSI Pumps, Subcooled Conditions.

When the RO stops the Charging/HHSI Pump, which one of the following describes the expected Pressurizer level response?

A. PRZR level will remain at its current value.

B. PRZR level will rise until charging is realigned to the VCT.

C. PRZR level will drop until normal charging and letdown are restored.

D. PRZR level will drop until RCS pressure stabilizes at a lower value, then will stabilize.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. If level is currently stable, it will drop until break flow equals makeup flow at the new, lower RCS pressure.
B. Incorrect. Level will not rise if one source of makeup is taken away unless the break was isolated, as in ECA-1.2.
C. Incorrect. Level will drop, but reason is independent of normal makeup.
D. Correct. Less flow, inventory and subcooling will drop until a new break flow at a new pressure is reached.

Technical Reference(s): ES-1.2 Step 17 (Attach if not previously provided)
Att 7-A

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		073K1.01	
	Importance Rating	3.6	3.9

Knowledge of the physical connections and/or cause-effect relationships between the PRM system and the following systems: Those systems served by PRMs

Proposed Question: Common 20

Given the following:

- The Unit is operating at 90% power with all systems in NSA.
- [GW-TK-1A], Gaseous Waste Decay Tank discharge is in progress.
- [1GW-F-1A], GW Disposal Blower is operating.
- [TV-1GW-103], GW Decay Tank Disch to CTWR Valve is open.
- [TV-1GW-103A2], GW Decay Tank Bleed Valve is open.
- [1GW-D-1-1A], GW Disposal Damper associated with the "A" GW Disposal Blower [1GW-F-1A] is open.

Then, the GW Disposal Blower Discharge radiation monitor [RM-1GW-108B] alarms on High-High Gaseous Activity.

Which one of the following completely describes the Gaseous Waste System automatic response?

A. [1GW-F-1A], GW Disposal Blower trips.

B. [1GW-D-1-1A], GW Disposal Damper shuts.

C. Valve [TV-1GW-103] and valve [TV-1GW-103A2] shut.

D. Blower [1GW-F-1A] trips and Damper [1GW-D-1-1A] shuts.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. GW Disposal Blower unaffected by RM-1GW-108B.
B. Incorrect. GW Disposal Damper unaffected by RM-1GW-108B.
C. Correct. [TV-1GW-103] and [TV-1GW-103A2] automatically shut on High-High Radiation as detected by RM-1GW-108B or RM-1GW-108A..
D. Incorrect. Blower and damper both unaffected.

Technical Reference(s): 1OM-43.1.E (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-43.1 Objective 2 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		011K2.01	
	Importance Rating	3.1	3.2

Knowledge of bus power supplies to the following: Charging pumps.

Proposed Question: Common 21

The Unit is operating at 80% power with all systems in NSA, when a Small Break LOCA in containment results in a reactor trip and an SI signal.

- 4160 Volt Emergency Bus 1AE supply breaker from off-site power trips.
- No. 1 EDG fails to start.

Which one of the following describes the expected status of the Charging Pumps?

Charging Pump A _____; Charging Pump B _____.

A. running; running

B. not running; running

C. running; not running

D. not running; not running

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Charging Pump "A" has no power.
B. Correct. 4160 Volt Emergency Bus 1AE powers the "A" Charging Pump. The "B" Charging Pump is powered by 4160 Volt Emergency Bus 1DF. When Bus 1AE is deenergized, the "A" Charging Pump will trip. The "B" Charging Pump will be automatically started by the safety injection signal.
C. Incorrect. Opposite of actual response.
D. Incorrect. Charging Pump "B" has a start signal and power available, so it will run.

Technical Reference(s): 1OM-7.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-7.1 Objective 19b (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		011K5.15	
	Importance Rating	3.6	4.0

Knowledge of the operational implications of the following concepts as they apply to the PZR LCS: PZR level indication when RCS is saturated.

Proposed Question: Common 22

Given the following conditions:

- A Loss of Off-Site Power has occurred.
- RCS cooldown is being performed in accordance with ES-0.2, Natural Circulation Cooldown.
- Reactor Coolant Pumps cannot yet be started.
- The RO is depressurizing using auxiliary spray.
- Pressurizer level rapidly rises from 24% to 66%.

Which one of the following describes the reason for the pressurizer level increase?

A. Loss of Secondary Heat Sink

B. Portions of the RCS have reached saturation temperature.

C. HHSI flow is refilling the Pressurizer as RCS pressure drops.

D. Cooldown rate is not high enough to maintain Pressurizer level with auxiliary spray in service.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Loss of Heat Sink will cause RCS heatup and level increase, but not the rapid rise seen here.
B. Correct.
C. Incorrect. HHSI is not running if the crew is in ES-0.2.
D. Incorrect. Auxiliary spray will not cause pressurizer level increase during cooldown IAW ES-0.2.

Technical Reference(s): ES-0.2 Step 18 (Attach if not previously provided)

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Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		012K4.06	
	Importance Rating	3.2	3.5

Knowledge of RPS design feature(s) and/or interlock(s): Automatic or manual enable/disable of RPS trips.

Proposed Question: Common 23

Given the following:

- A Unit startup is in progress and all Nuclear Instrumentation is observed to be operating normally.
- Power Range Channel N-43 is 11%.
- Power Range Channel N-41, N-42 and N-44 are 9%.

Which one of the following is correct concerning RPS trips?

A. Power Range, high setpoint trip and Source Range high flux trip are enabled.

B. Power Range, low setpoint trip and Source Range high flux trip are disabled.

C. Power Range, high setpoint trip and Intermediate Range high flux trip are enabled.

D. Power Range, low setpoint trip and Intermediate Range high flux trip are disabled.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Power Range, high range, high level trip is always active; however, the Source Range high level trip is bypassed when power is above P6, which would be the case with power ranges indicating approximately 10%.
B. Incorrect. Power Range, low range, high level trip is active with < 2 power range channels above P10 (10% power); however, the Source Range high level trip is bypassed when power is above P6, which would be the case with power ranges indicating approximately 10%.
C. Correct. Power Range, high range, high level trip is always active, and the Intermediate Range high level trip are enabled with < 2 power range channels above P10 (10% power).
D. Incorrect. Power Range, low range, high level trip is active with < 2 power range channels above P10 (10% power), and the Intermediate Range high level trip are enabled with < 2 power range channels above P10 (10% power).

Technical Reference(s): 1OM-1.2B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 7 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		012K6.06	
	Importance Rating	2.7	2.8

Knowledge of the effect that a loss or malfunction of the following will have on the RPS: Sensors and detectors

Proposed Question: Common 24

Given the following conditions:

- The Unit was operating at 68% power.
- An automatic reactor trip occurred.
- The cause of the trip was low RCS flow in Loop 'A'.
- The cause of the trip was determined to be an instrument failure.

Which one of the following input failures caused the reactor trip?

A. The Loop 'A' high pressure side flow input failed high.

B. The Loop 'A' high pressure side flow input failed low.

C. One Loop 'A' low pressure side flow input failed high.

D. One Loop 'A' low pressure side flow input failed low.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. High side input will indicate high DP and high flow.
B. Correct. Each flow transmitter takes input from 1 high side tap and 3 low side taps. If the high side tap fails low, then all 3 DPs indicate low, satisfying the 2/3 logic for 1 loop low flow trip.
C. Incorrect. Low side tap failing high only causes 1 out of 3 low flow trips. 2 out of 3 are required for reactor trip to occur.
D. Incorrect. Low side failing low would cause a high DP and high flow indication.

Technical Reference(s): 1OM-6 Figure 6-1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 8 and 11 (As available)

Question Source: Bank # Vendor Bank
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		016K3.01	
	Importance Rating	3.4	3.6

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

Proposed Question: Common 25

Given the following conditions:

- The Unit is at 100% power. All systems are in NSA.
- [PT-1MS-446], First Stage Pressure is selected for Tref input to Rod Control System. It begins to fail DOWNSCALE.

Assuming no action by the crew, which one of the following primary plant parameters will initially INCREASE as a result of the transmitter failure?

A. Charging flow

B. RCS Tavg

C. Reactor power

D. RCS loop Delta-T

Proposed Answer: A

Explanation (Optional):

A. Correct. As first stage pressure input fails low, rods will insert. (BVPS-1 places rods in auto at 100% power). RCS temperature will decrease as a result of the rod insertion. Since there is no additional steam demand, Rx power will also decrease. If power decreases, loop Delta-T also decreases. If RCS temperature decreases, then the volume of RCS fluid also decreases, requiring additional charging flow to maintain pressurizer level on program
B. Incorrect. Tavg drops because of rod insertion.
C. Incorrect. Reactor power drops due to negative reactivity added by rods.
D. Incorrect. Loop Delta-T drops because rod control is driving Thot down, and Tcold remains relatively constant.

Technical Reference(s): 1OM-24.4.IF (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: GO-3ATA-5 Objective 7 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		035A1.02	
	Importance Rating	3.5	3.8

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Steam Generating System controls including: SG Pressure

Proposed Question: Common 26

Given the following conditions:

- A Unit startup is in progress.
- The crew is preparing to warm up the main steam lines.

Which one of the following actions will cause 'A' SG pressure to INCREASE in this plant configuration?

A. Decrease SG Atmospheric Dump Valve controller output.

B. Decrease SG Atmospheric Dump Valve controller setpoint.

C. Increase Main Steam Dump pressure controller output.

D. Increase Main Steam Dump pressure controller setpoint.

Proposed Answer: A

Explanation (Optional):

A. Correct. SG Atmospheric dump valves are operated in manual at BVPS-1. Decreasing the output will close the valve, resulting in higher SG pressure.
B. Incorrect. Changing the setpoint has no effect in manual.
C. Incorrect. Steam line warmup, condenser not yet in service.
D. Incorrect. Steam line warmup, condenser not in service yet.

Technical Reference(s): 1OM-21.1.D (Attach if not previously provided)
1OM-21 valve list

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-21.1 Objective 8 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	2
		028K6.01	
	Importance Rating	2.6	3.1

Knowledge of the effect of a loss or malfunction of the following will have on the HRPS: Hydrogen recombiners.

Proposed Question: Common 27

Given the following conditions:

- A Large Break LOCA has occurred.
- Both hydrogen recombiners are in service.
- The following control room annunciator alarms light turns OFF:
  - [A2-18], A-HYDROGEN RECOMBINER RUNNING

Which one of the following describes the effect on the removal of hydrogen from Containment?

A. Hydrogen concentration will remain below 4% with only one Recombiner in operation.

B. Hydrogen concentration will rise above 4% but remain below 13% with only one Recombiner in operation.

C. Hydrogen concentration will remain below 4% only if the Containment Purge System is placed in service in addition to the Recombiner.

D. Hydrogen concentration will remain below 4% only if Containment Spray is placed in service in addition to the Recombiner.

Proposed Answer: A

Explanation (Optional):

A. Correct. Either train will meet design function.
B. Incorrect. 4% is the limit. 13% was chosen as the approximate value for explosive mixture.
C. Incorrect. Purge system would not be placed in service as a result of a recombiner failure.
D. Incorrect. Spray will not be in service at the pressures that H2 recombiners operate at.

Technical Reference(s): 1OM-46.4.AAA (Attach if not previously provided)

1OM-46.1.A, B

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-46.1 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		033K4.02	
	Importance Rating	2.5	2.7

Knowledge of SFP Cooling design feature(s) and/or interlock(s) which provide for the following: Maintenance of spent fuel cleanliness.

Proposed Question: Common 28

The Unit is in Mode 1. All systems are in NSA.

Which one of the following describes the normal operation of the Spent Fuel Pool Purification System?

A. Two Purification Circulating pumps take suction from the Spent Fuel Pool skimmers. Each pump discharges through a separate filter and Ion Exchanger.

B. Either or both of two Purification Circulating pumps take suction from submerged piping in the Spent Fuel Pool. Each pump discharges through a separate filter and a common Ion Exchanger.

C. One Purification Circulating pump takes suction on submerged piping in the Spent Fuel Pool. The other pump is aligned for RWST purification. Each pump discharges through separate filters and Ion Exchangers.

D. One Purification pump takes suction from the Spent Fuel Pool skimmers. The other pump is aligned for RWST purification. Each pump discharges through separate filters and Ion Exchangers.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Skimmers operated intermittently as necessary.
B. Correct.
C. Incorrect. Either pump may be aligned to RWST but not normally.
D. Incorrect. Either pump may be aligned to RWST but not normally, skimmers only used when necessary.

Technical Reference(s): 1OM-20.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-20.1 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		039K5.08	
	Importance Rating	3.6	3.6

Knowledge of the operational implications of the following concepts as they apply to the MRSS: Effect of steam removal on reactivity.

Proposed Question: Common 29

Given the following conditions:

- A Unit startup is in progress following a mid-cycle outage.
- The reactor is critical at $1E^{-8}$ amps.

A Main Condenser steam dump valve fails partially open.

Assuming NO action by the crew, which one of the following describes the immediate effect on the plant?

A. Power INCREASES; RCS Temperature INCREASES.

B. Power INCREASES; RCS Temperature DECREASES.

C. Power DECREASES; RCS Temperature INCREASES.

D. Power DECREASES; RCS Temperature DECREASES.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. More steam demand will cause temperature to decrease.
B. Correct. Negative MTC (MOL). If temperature decreases, power increases.
C. Incorrect. Power increases due to negative MTC. Temperature decreases due to increased heat removal.
D. Incorrect. If MTC was positive, this would be the initial effect, but MTC is only positive at BOL high boron concentration.

Technical Reference(s): GFE – Reactor Operational Physics (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
		062K4.01	
	Importance Rating	2.6	3.2

Knowledge of AC Distribution System design feature(s) and/or interlock(s) which provide for the following: Bus lockouts

Proposed Question: Common 30

Which one of the following conditions will PREVENT the No. 1 EDG output breaker from closing to energize 4KV bus 1AE following a loss of power?

A. [ACB-1A10], Emergency Bus 1AE feeder breaker has an undervoltage trip.

B. [ACB-1A10], Emergency Bus 1AE feeder breaker has an overcurrent trip.

C. [ACB-41C], Normal 4KV Bus 1A feeder breaker has an overcurrent trip with bus 1AE normal feeder breaker control switch position in "Auto After Close".

D. [ACB-41C], Normal 4KV Bus 1A feeder breaker, has an undervoltage trip with bus 1AE normal feeder breaker control switch position in "Auto After Close".

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Undervoltage would be a start signal for the EDG.
B. Correct. Bus overcurrent on 1AE will cause lockout.
C. Incorrect. Lockout on normal 4KV bus will not cause lockout on emergency bus regardless of emergency bus switch position.
D. Incorrect. Undervoltage on normal 4KV bus will cause undervoltage on emergency bus, resulting in EDG start and load, as long as no lockouts exist.

Technical Reference(s): 1OM-36.1.E (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-36.2 Objective 12 (As available)

Question Source: Bank #

Modified Bank # X (Note changes or attach parent)
New

Question History: 1LOT4 RO Audit

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
		005K5.02	
	Importance Rating	3.4	3.5

Knowledge of the operational implications of the following concepts as they apply to the RHRS: Need for adequate subcooling.

Proposed Question: Common 31

Given the following conditions:

- The Unit is in Mode 6.
- RHR is in service.
- RCS temperature is 139°F.
- RCS Boron Concentration is 1822 ppm.
- RCS drain down is in progress in preparation for refueling.

[MOV-1RH-758], RHR Heat Exchanger Flow Control Valve, begins to drift in the closed direction due to an electrical problem.

Assuming NO action by the crew, which one of the following describes the effect of this failure on plant operation?

A. RCS cooldown to a temperature below the RCS boron solubility limit.

B. Loss of NPSH to the operating RHR pump due to increased temperature.

C. OPPS actuation due to overpressurization of the RCS.

D. Loss of RHR letdown and uncontrolled RCS level increase.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. RCS will heat up when the flow control valve goes closed.
B. Correct. RCS at atmospheric pressure, temperature rising will result in loss of subcooling. Loss of subcooling means loss of NPSH.
C. Incorrect. OPPS actuation will not occur because head removal means RCS at atmospheric pressure.
D. Incorrect. The flow control valve would not affect the manually throttled RHR letdown at

this temperature, and with no inventory makeup in progress, level would not increase appreciably.

Technical Reference(s): 1OM-10.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-19.1 Objective 18 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
		005A4.04	
	Importance Rating	3.1	2.9

Ability to manually operate and/or monitor in the Control Room: Controls and indication for closed cooling water pumps.

Proposed Question: Common 32

Given the following conditions:

- The Unit is in Mode 4.
- RCS cooldown is in progress on RHR Train 'B'.
- CCR Train 'A' and Train 'B' are aligned to provide cooling water to RHR.

Which one of the following describes the flow limits placed on the CCR system in this alignment, and the method used to determine actual flow?

A. Total CCR system flow is limited to 4500 gpm. The actual flow is determined by adding the flows on the 8 inch, 14 inch, and 24 inch CCR headers.

B. Each CCR pump is limited to a total of 6500 gpm. The actual flow is determined by adding the flows on the 8 inch, 14 inch, and 24 inch CCR headers.

C. Total CCR flow through the RHR Heat Exchanger is 4500 gpm. The actual flow is determined directly from the 24 inch CCR header.

D. Total CCR flow through the RHR Heat Exchanger is 6500 gpm. The actual flow is determined directly from the 24 inch CCR header.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Flow limit is 6500. Total flow could potentially be 13,000 gpm with 2 pumps.
B. Correct.
C. Incorrect. Limit is for CCR pump total flow, not through RHR HX. Also wrong value.
D. Incorrect. Limit is for CCR pump total flow, not through RHR HX.

Technical Reference(s): 1OM-10.4.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-10.1 Objective 20 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.1.18	
	Importance Rating	2.9	3.0

Ability to make accurate, clear and concise logs, records, status boards, and reports.

Proposed Question: Common 33

Surveillance Verification Log L5 is being performed for the 0000 - 0800 shift.

The RO determines that the NIS Cabinet Power Range indication is not within allowable limits.

Which one of the following describes how this is documented on the L5 log?

A. Circle all readings in red pen that are not in compliance. US must initial the L5 log in the time column next to the unsatisfactory check.

B. Circle all readings in red pen that are not in compliance. Details of the unsatisfactory check must be documented in the remarks section. US must review the log at least once every shift.

C. Mark 'UNSAT' in the time column opposite the unsatisfactory check. Record details of the check in the remarks section. The US must review the log prior to end of shift.

D. Mark 'UNSAT' in the time column opposite the unsatisfactory check. Record details of the check in the remarks section. The US must initial the L5 log in the time column next to the UNSAT comment.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. US does not initial.
B. Correct. Red circle required for L5. US must sign once per shift.
C. Incorrect. UNSAT not marked in time column for L5 log.
D. Incorrect. US does not initial next to UNSAT. Reviews when rounds completed.

Technical Reference(s): 1OM-54.1.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-48.1 Objective 22 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.1.24	
	Importance Rating	2.8	3.1

Ability to obtain and interpret station electrical and mechanical drawings.

Proposed Question: Common 34

Given the following:

- [1QS-MR-1A], Refueling Water Refrigeration Unit is "ON."
- One refueling water recirculation pump running slow.
- [TS-1QS200A2], Refrigeration Unit Operating Thermostat is actuated.

Using the diagram provided, which one of the following describes the status of the refueling water refrigeration unit?

[1QS-MR-1A], Refueling Water Refrigeration Unit is...

A. started, and liquid line solenoid is energized to open.

B. stopped, and liquid line solenoid is energized to close.

C. started, and liquid line solenoid is deenergized to open.

D. stopped, and liquid line solenoid is deenergized to close.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Not started, but stopped.
B. Incorrect. Deenergized to close.
C. Incorrect. Energized to open, and stopped, not started.
D. Correct. TS-1QS200A2, Refrigeration Unit operating thermostat actuated is a trip signal. Any trip signal present removes the start permissive and stops the Refueling Water Refrigeration Unit. Also, the liquid line solenoid deenergized to close.

Technical Reference(s): LSK-29-5A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: LSK-29-5A

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:
Logic diagrams

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		2.1.25	
	Importance Rating	2.8	3.1

Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.

Proposed Question: Common 35

Given the following conditions:

- The Unit has been at 100% power for 3 weeks. All systems are in NSA.
- RCS boron concentration is 1100 ppm.
- A controlled power reduction to 50% is required.

Using the references provided and maintaining control rods at their current position, which one of the following describes the amount of boric acid required to initially maneuver the plant to 50% power?

A. 900 gallons

B. 1100 gallons

C. 1300 gallons

D. 1500 gallons

Proposed Answer: A

Explanation (Optional):

A. Correct. Power defect is approximately 1875 – 100 = 875 pcm. Critical Boron concentration of 1100 ppm indicates approximately 7000 MWD/MTU. Boron worth at this concentration is approximately - 6.8 pcm/ppm. Therefore, 875/ - 6.8 = 128 ppm. Using boron addition nomograph shows approximately 900 gallons of boric acid or less.
B. Incorrect. High enough to allow for minor interpretation differences on nomograph reading.
C. Incorrect. Used to provide consistent distractor and allows for minor interpretation differences.
D. Incorrect. Used to provide consistent distractor and allows for minor interpretation differences.

Technical Reference(s): Curve Book (Curves provided) (Attach if not previously provided)

Proposed References to be provided to applicants during examination: Plant Curves

Learning Objective: 1SQS-7.1 Objective 27 (As available)

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

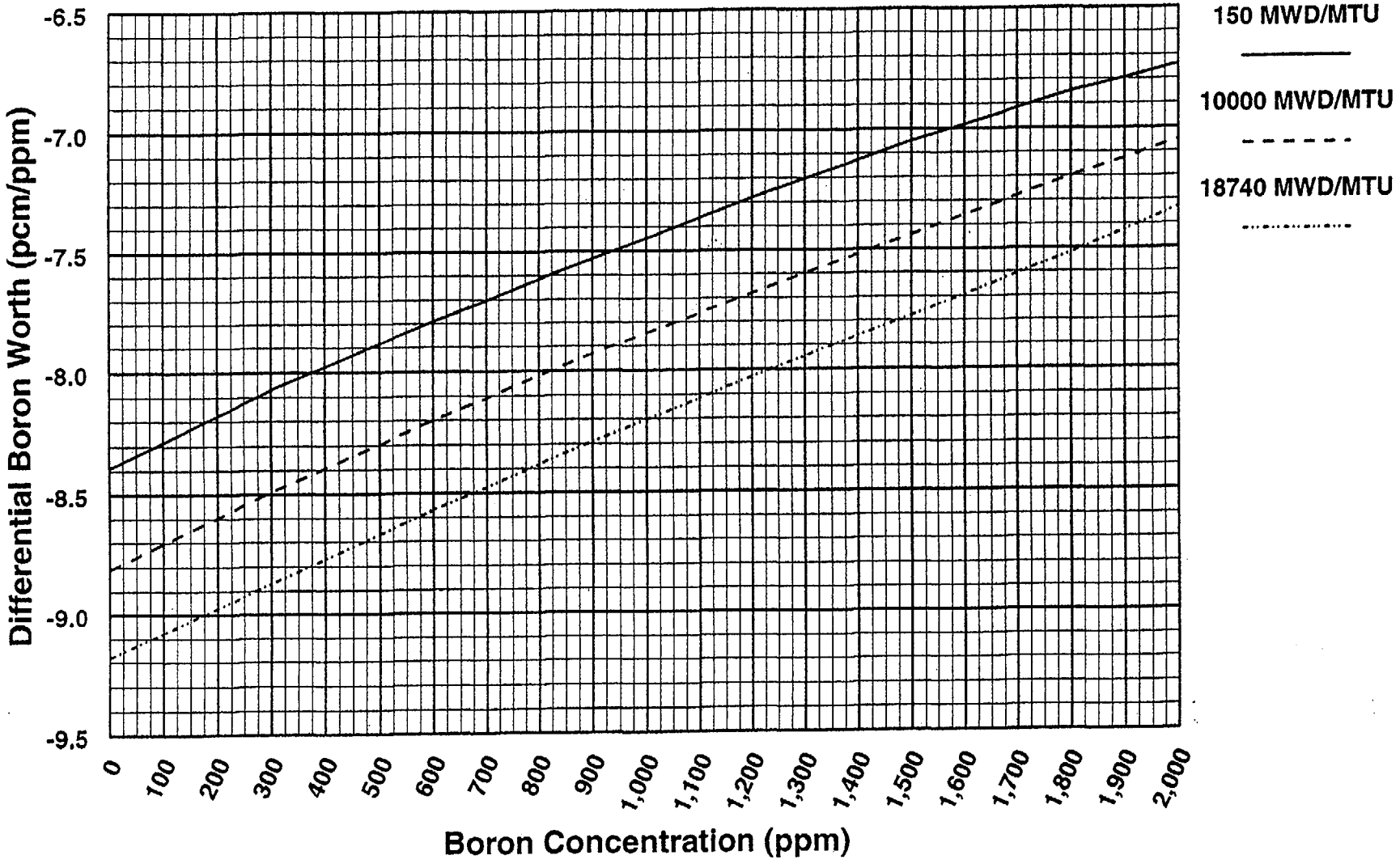
Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Application

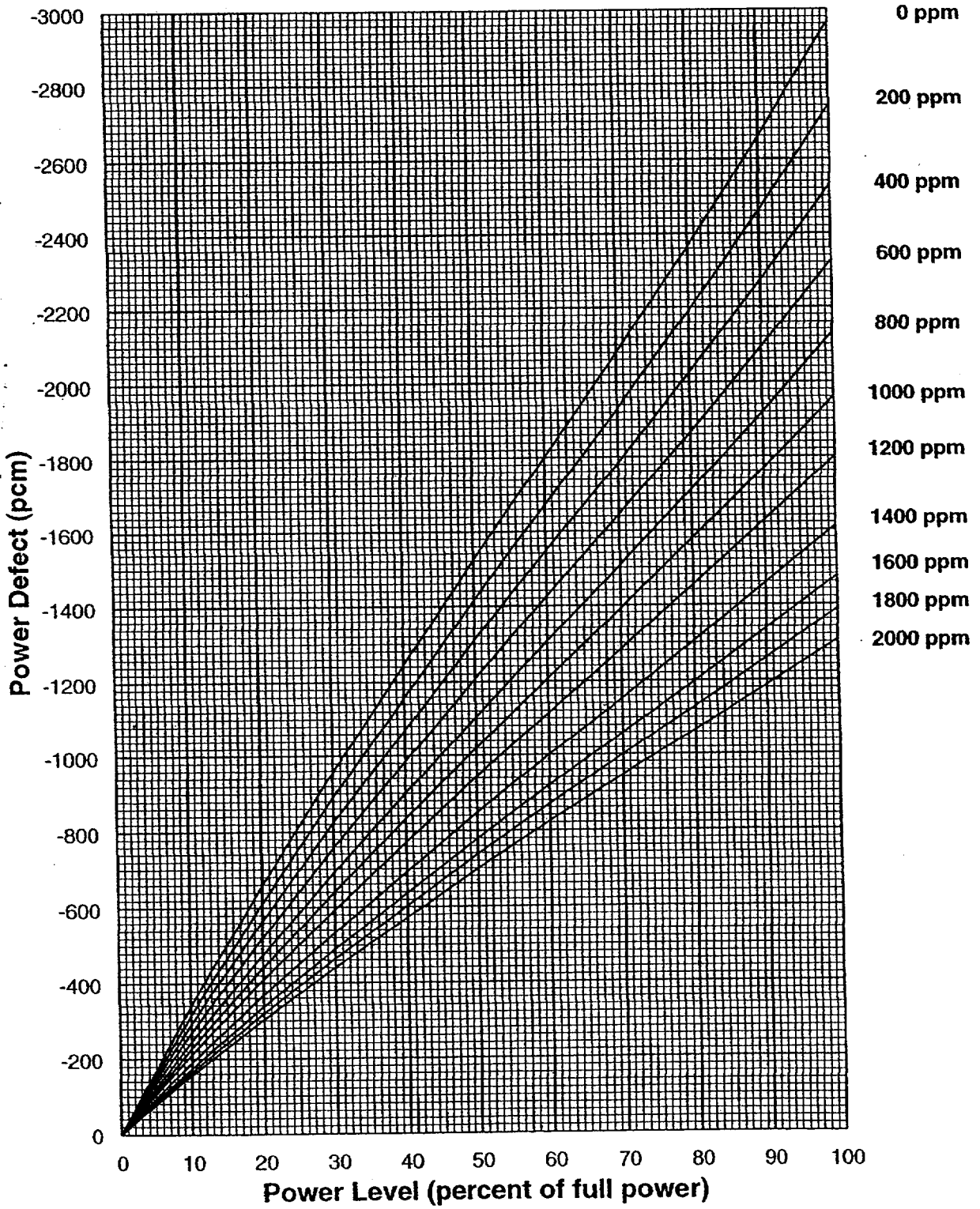
10 CFR Part 55 Content: 55.41 X
55.43

Comments:

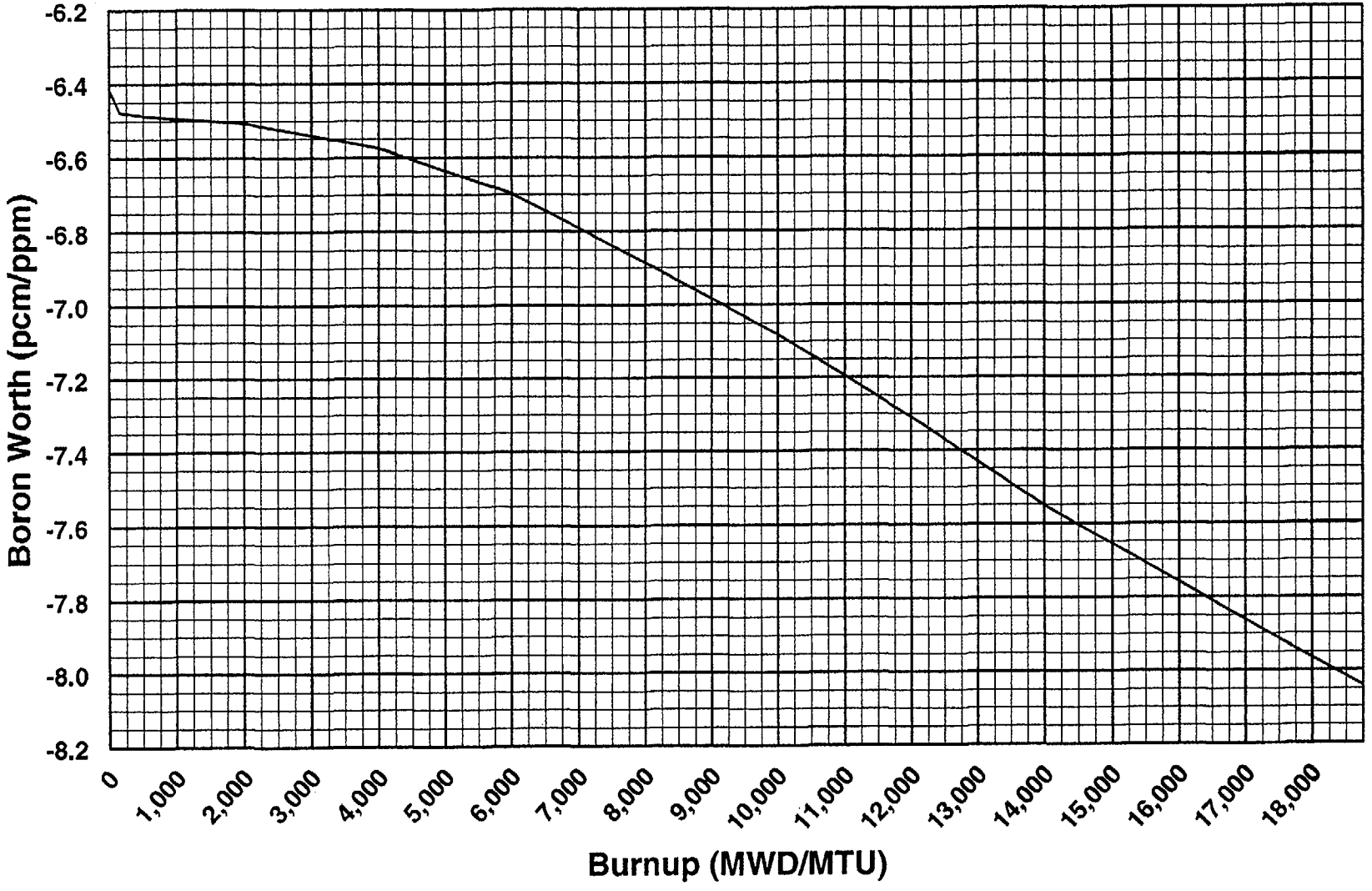
HZP Differential Boron Worth vs Boron Concentration Unit 1, Cycle 15



POWER DEFECT vs PERCENT POWER at BOL, MOL, and EOL Unit 1, Cycle 15



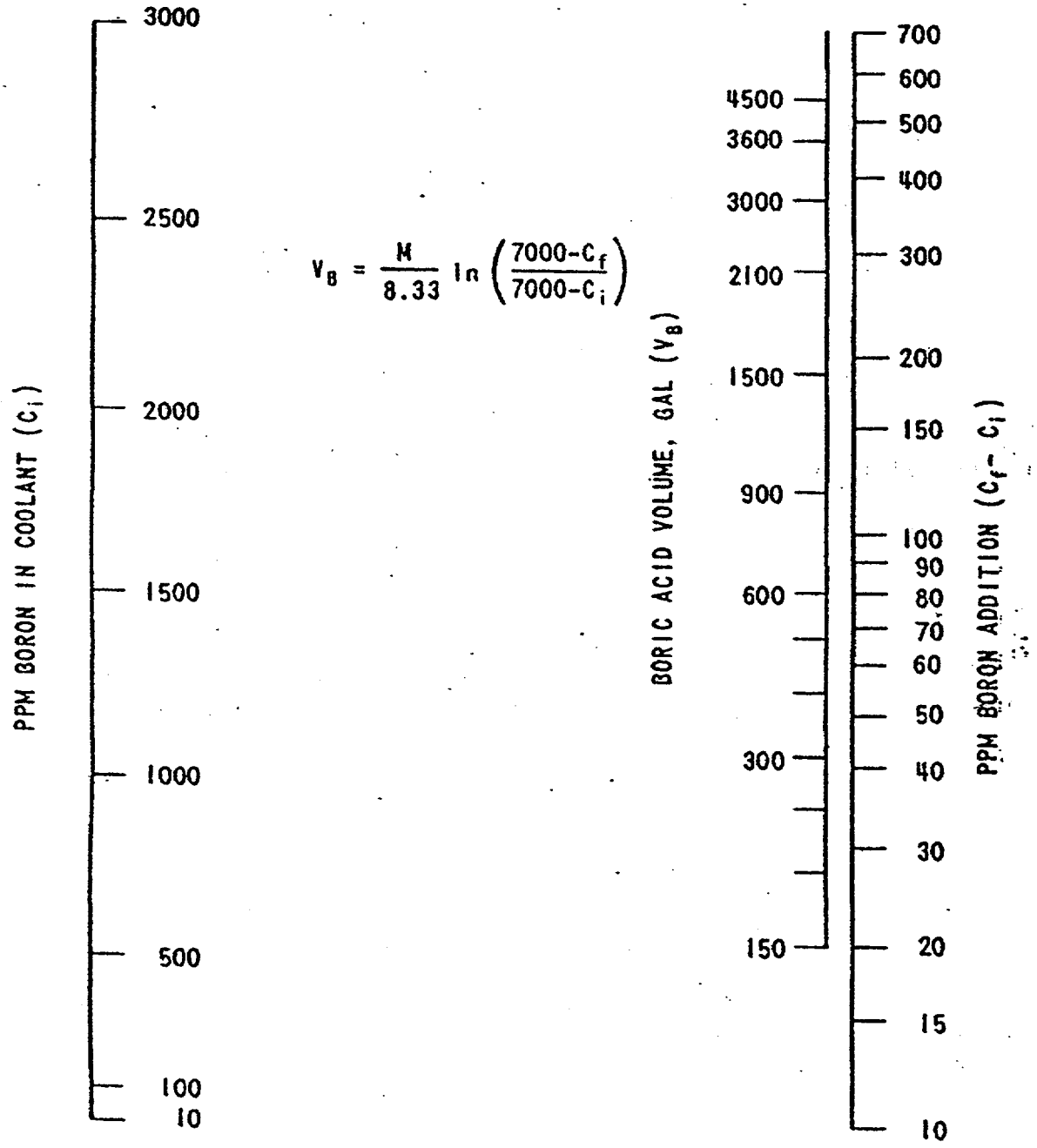
Boron Worth vs Burnup
ARO, HFP, Critical Boron
Unit 1, Cycle 15



CB-31

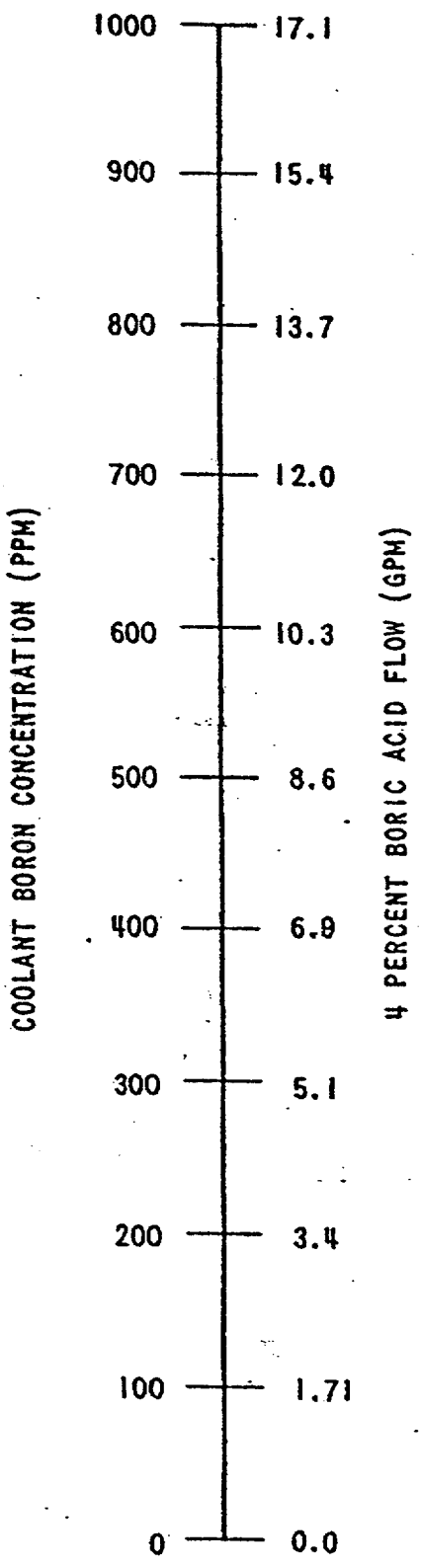
Record Type #9A.345D

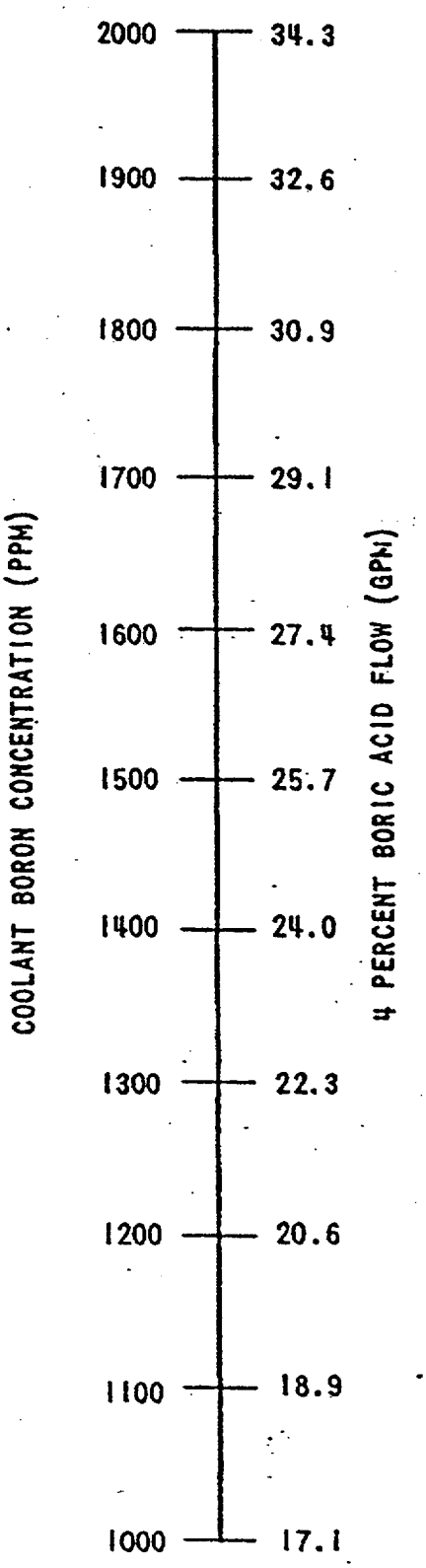
$$V_B = \frac{M}{8.33} \ln\left(\frac{7000-C_f}{7000-C_i}\right)$$



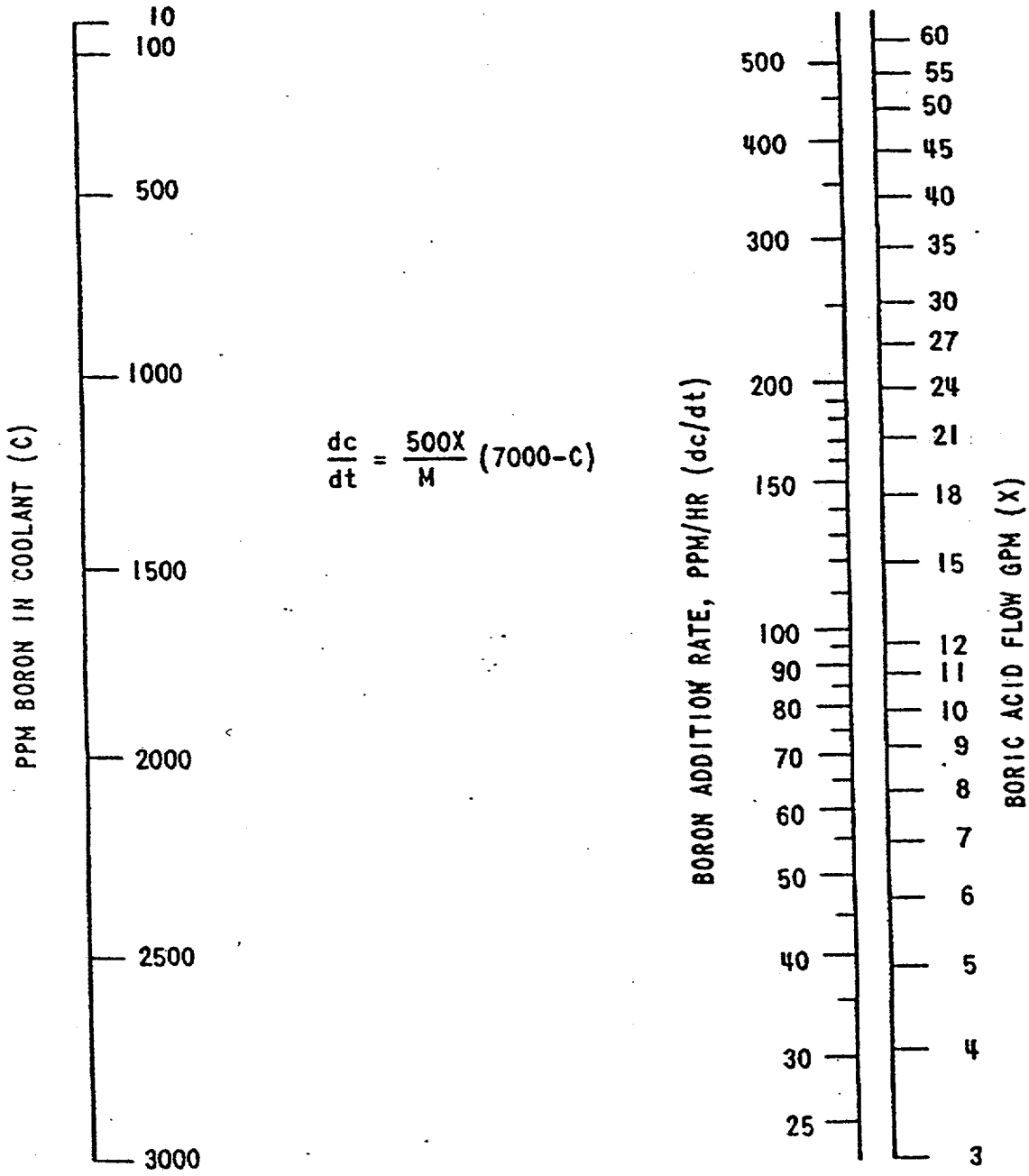
BORON ADDITION

(refer to figure CB-36 for correction factors)



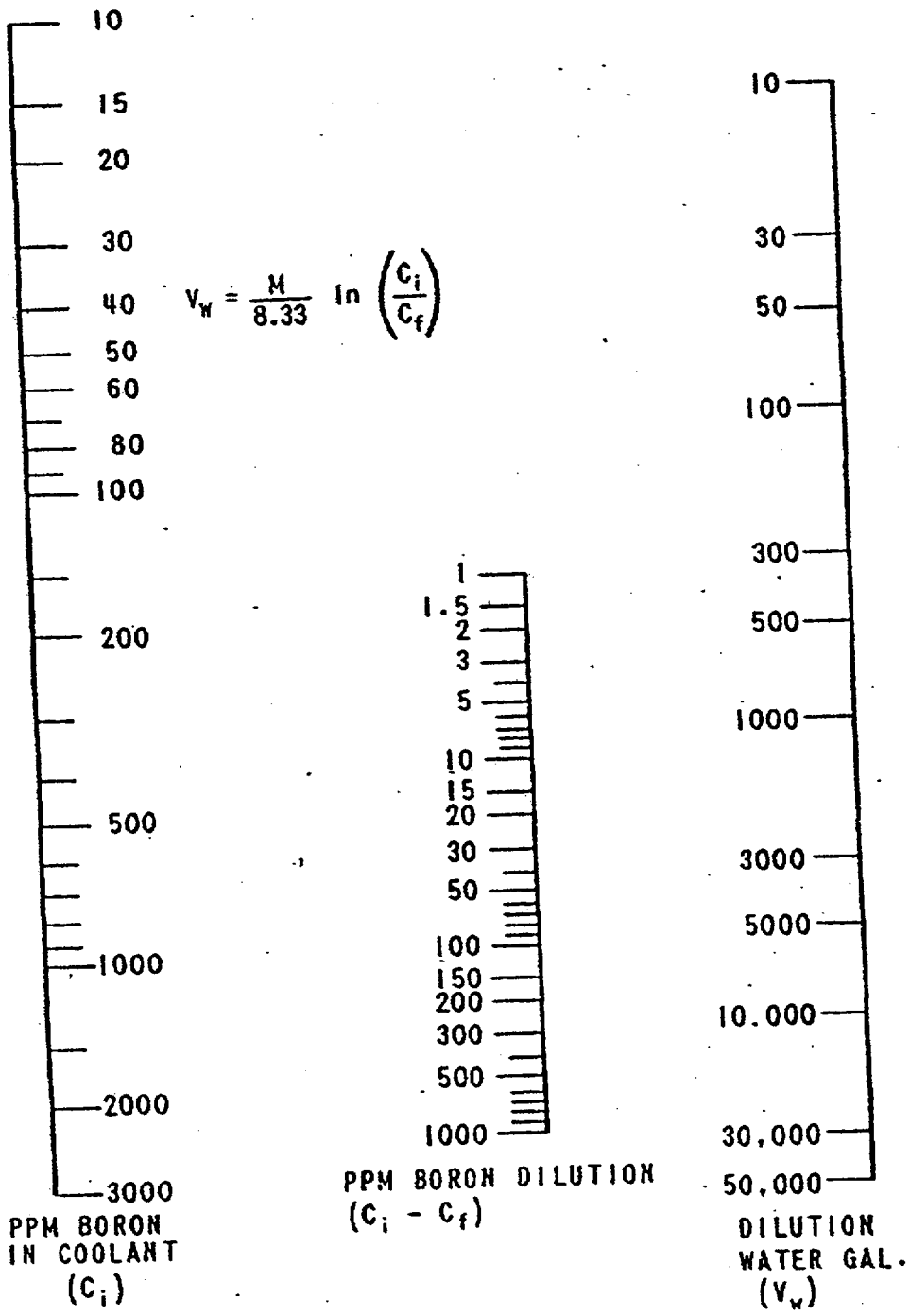


BLENDED FLOW BASED ON 120 GPM AUTO MAKEUP



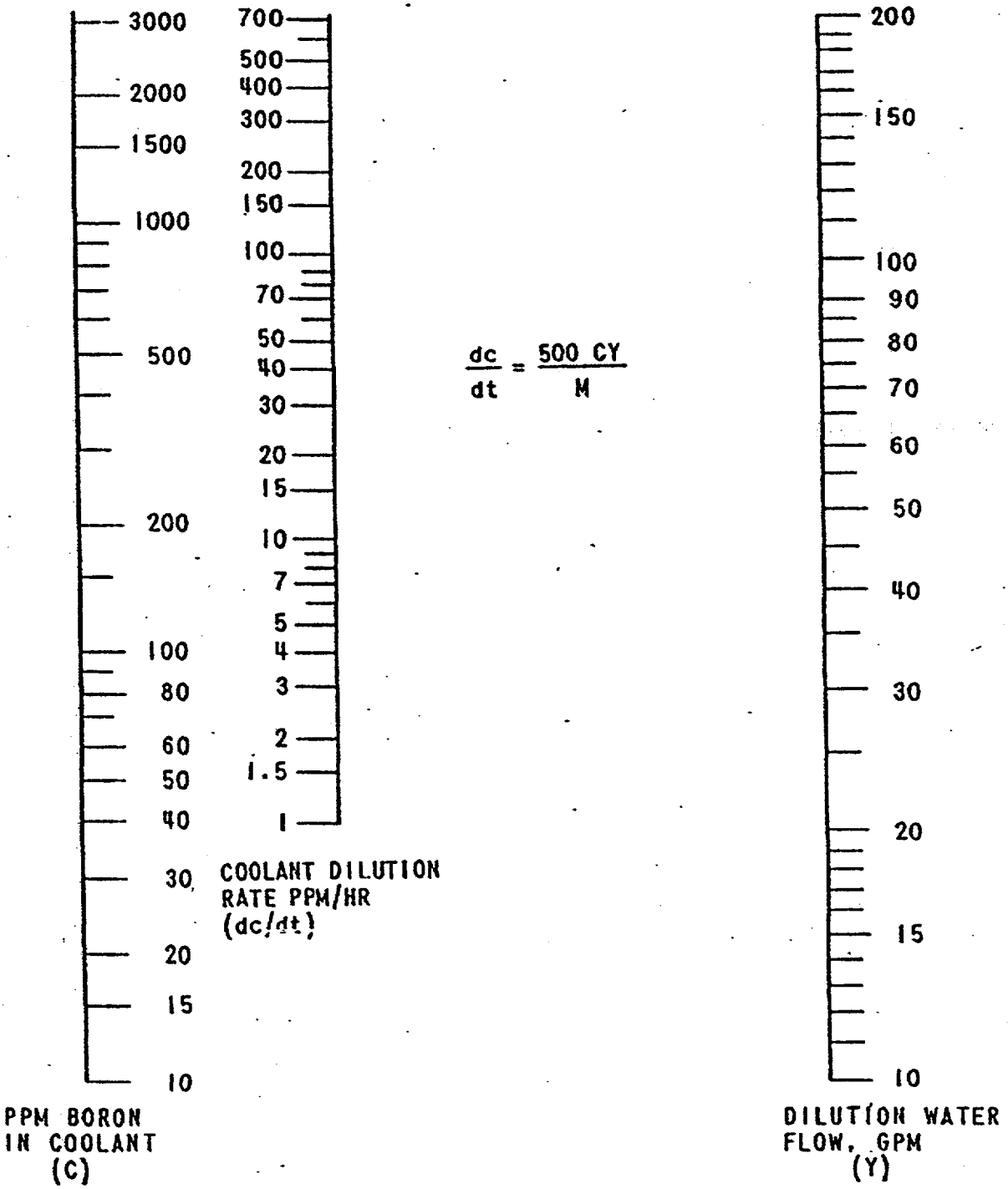
BORON ADDITION RATE

(refer to figure CB-36 for correction factors)



BORON DILUTION

(refer to figure CB-36 for correction factors)



BORON DILUTION RATE

(refer to figure CB–36 for correction factors)

NOMOGRAPH CORRECTION FACTORS

Plant Conditions			Correction Factor (K) (See Note)
Pressure (psig)	T (AVG) (°F)	Pressurizer Level	
2235	547-570	Normal Operating	1.00
1600	500	No-Load	1.05
1200	450	No-Load	1.10
800	400	No-Load	1.16
400	350	No-Load	1.18
400	300	No-Load	1.20
400	300	Solid Water	1.35
400	200	No-Load	1.28
400	200	Solid Water	1.40
400	100	Solid Water	1.47

NOTE: CORRECTION FACTORS ARE APPLIED AS FOLLOWS:

(a) Boron Addition and Dilution Total Volume Nomographs

$$V_{(Corrected)} = K \times V_{(Nomograph)}$$

(b) Boron Addition and Dilution Rate Nomographs

$$\frac{dc}{dt}_{(Corrected)} = \frac{1}{K} \times \frac{dc}{dt}_{(Nomograph)}$$

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.2.1	
	Importance Rating	3.7	3.6

Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

Proposed Question: Common 37

Given the following conditions:

- A reactor startup is in progress.
- Control Bank "A" withdrawal is in progress.
- The last two 1/M plots indicate that criticality will be achieved on Control Bank "B" at approximately 100 steps.
- Estimated Critical Position is Control Bank "C" at 144 steps.

Which one of the following actions is required for these conditions?

A. Trip the reactor and initiate Emergency Boration.

B. Stop the startup and determine whether criticality will be within 500 pcm of the ECP prior to proceeding.

C. Insert all Control Banks to zero steps, verify Shutdown Margin and recalculate the ECP.

D. Continue the startup to obtain one additional 1/M data point to validate the accuracy of the plot.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Required if critical below RIL.
B. Incorrect. Criticality apparent below RIL.
C. Correct.
D. Incorrect. Would not proceed with CB withdrawal if 2 consecutive plots show criticality below RIL.

Technical Reference(s): 1OM-50.2.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.2.33	
	Importance Rating	2.5	2.9

Knowledge of control rod programming.

Proposed Question: Common 38

Given the following conditions:

- The Control Rod full out position is 230 steps.
- The required bank overlap for the current fuel cycle is 102 steps.

During rod withdrawal, when Control Bank "B" reaches full out position, what will be the position of Control Bank "C"?

A. 000 steps

B. 102 steps

C. 128 steps

D. 230 steps

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Bank D would still be 0 steps, but Bank "C" will withdraw when Bank "B" reaches 128 steps.
B. Correct. Bank "C" will begin withdrawal at "B" = 128 steps.
C. Incorrect. Assumes withdrawal starts at 102 steps on "B".
D. Incorrect. Would have to assume Bank "C" is withdrawn before "B".

Technical Reference(s): 1OM Figure 1.16 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3 Objective 16 (As available)

Question Source: Bank #
Modified Bank # 1LOT4 RO/SRO #93 (Note changes or attach parent)
New

Question History: 1LOT4 RO/SRO #93

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		2.3.11	
	Importance Rating	2.7	3.2

Ability to control radiation releases

Proposed Question: Common 39

Given the following conditions:

- A rapid load reduction from 100% power to 65% power was performed approximately 3 hours ago.
- [RM-1CH-101B], Reactor Coolant Letdown Low Range Monitor is in alarm.
- [RM-1CH-101A], Reactor Coolant Letdown High Range Monitor has just reached its alarm setpoint.
- Actions of 1OM-43.4.AAC, Radiation Monitoring HIGH-HIGH have been completed.
- Chemistry confirms RCS activity exceeds TS 3.4.8 limits.

The Unit Supervisor directs a Unit shutdown be performed.

Which one of the following actions is designed to limit the release of radioactivity in the event of a subsequent SGTR?

A. MSIVs are closed.

B. SG Atmospheric Dump valve setpoints are raised.

C. RCS is cooled down below 500°F.

D. Maximum Condensate Polishers are placed in service.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Closing MSIVs would contribute to rad release through SG ADVs and Safeties if cooldown and depressurization was not performed in a timely manner.
B. Incorrect. ADV setpoints are normally raised in SGTR procedure, but operated manually at BVPS-1.
C. Correct.
D. Incorrect. Condensate polishing would help clean the secondary plant but not an action

performed in accordance with the ARPs.

Technical Reference(s): TS 3.4.8 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-43.1 Objectives 9 and 10 (As available)

Question Source: Bank #
Modified Bank # (Vendor Bank. Previous NRC) (Note changes or attach parent)
New

Question History: (Vendor Bank. Previous NRC)

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.3.9	
	Importance Rating	2.5	3.4

Knowledge of the process for performing a Containment Purge

Proposed Question: Common 40

The Unit is in Mode 5. Preparations are being made to enter Containment.

Which one of the following describes the correct sequence for initiating a Containment Purge to the Ventilation Vent?

A. Open Supply and Exhaust dampers, start [1VS-F-5], CNMT Purge Exhaust Fan. If desired, start [1VS-HV-5], CNMT Purge Vent Sup Fan, after ensuring the NORMAL/REFUELING control switch is in the NORMAL position.

B. Open Supply and Exhaust dampers, start [1VS-F-5], CNMT Purge Exhaust Fan. If desired, start [1VS-HV-5], CNMT Purge Vent Sup Fan, after ensuring the NORMAL/REFUELING control switch is in the REFUELING position.

C. Start [1VS-F-5], CNMT Purge Exhaust Fan. Ensure the Supply and Exhaust dampers open. Place the NORMAL/REFUELING control switch is in the NORMAL position, and start [1VS-HV-5], CNMT Purge Vent Sup Fan.

D. Start [1VS-F-5], CNMT Purge Exhaust Fan. Ensure the Supply and Exhaust dampers open. Place the NORMAL/REFUELING control switch is in the REFUELING position, and start [1VS-HV-5], CNMT Purge Vent Sup Fan.

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. Switch should be placed in NORMAL.
C. Incorrect. Wrong sequence and dampers are manually aligned.
D. Incorrect. Wrong sequence, wrong switch position and dampers are manually aligned.

Technical Reference(s): 1OM-44C.4.A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-44.C.1 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
		G2.3.1	
	Importance Rating	2.6	3.0

Knowledge of 10CFR20 and related facility radiation control requirements

Proposed Question: Common 41

Who, by title, can authorize a person to receive a radiation dose in excess of the Beaver Valley Administrative TEDE limits?

A. Site Senior Vice President

B. Plant General Manager

C. Superintendent, Operations

D. Manager, Health Physics

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Authorizes Planned Special Exposures.
B. Correct.
C. Incorrect. Serves on ALARA committee or establishes other ALARA support.
D. Incorrect. Authorizes Planned Special Exposures and enforces ALARA policies.

Technical Reference(s): 1/2 ADM - 1631 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 08-01-801 Objective 29 (As available)

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

Question History: 1LOT4 SRO exam #24

Question Cognitive Level:	Memory or Fundamental Knowledge	X
	Comprehension or Analysis	
10 CFR Part 55 Content:	55.41	X
	55.43	

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	001AK1.23	
	Importance Rating	2.6	2.9

Knowledge of the operational implications of the following concepts as they apply to continuous Rod Withdrawal: Calculation of power defect: algebraic sum of moderator temperature and fuel temperature defects.

Proposed Question: Common 42

The Unit is at 97% power. All systems are in NSA.

The RO withdraws control rods 2 steps for Tavg control. When the In-Hold-Out switch is released, rod motion continues.

The following alarms are received:

- [A4-46], Tavg Deviation from Tref
- [A4-51], Loop Tavg High

The rod motion stops prior to any operator action occurring.

Which one of the following describes an INITIAL reactivity effect of the rod motion?

A. The positive reactivity added by FTC and MTC result in a higher total power defect.

B. The negative reactivity added by FTC and MTC result in a higher total power defect.

C. The positive reactivity added by FTC and MTC result in a lower total power defect.

D. The positive reactivity added by FTC and MTC result in a higher total power defect.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. As rods withdraw, adding positive reactivity, Tavg rises. With MTC and FTC at negative values, it results in negative reactivity being added, which will add to the total negative value of power defect.

B. Correct.

C. Incorrect. Negative reactivity is added by MTC and FTC.

D. Incorrect. Negative reactivity is added by MTC and FTC.

Technical Reference(s): Plant curves 5A,5B,5C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: GFE - Operational Physics (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	003AA2.04	
	Importance Rating	3.4	3.6

Ability to determine and interpret the following as they apply to the Dropped Control Rod: Rod motion stops due to dropped rod.

Proposed Question: Common 43

Given the following conditions:

The Unit is at 100% power with all systems in NSA.

- [A4-97], ROD CONTROL SYSTEM NON-URGENT ALARM illuminates.
- [A4-126], ROD BOTTOM ROD DROP is illuminated.
- One Control Bank "D" rod is indicating '0' steps.
- The RO places Rod Control in MANUAL.
- Other Control Room annunciators illuminate as expected for plant conditions.
- Reactor power indicates as follows:
  - N41 - 100.1%
  - N42 – 103.3%
  - N43 – 100.1%
  - N44 – 94.7%

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

A. The Rod Control System Non-Urgent condition must be cleared.

B. The 'Loop OP Delta-T Auto Turbine Runback Block Auto Rod Withdrawal' circuitry must be reset.

C. The 'NIS Power Range High Setpoint Overpower Rod Stop Block Auto Rod W/D' must be cleared.

D. The 'Power Range Channel Deviation' must be cleared at the NIS Comparator and Rate Drawer.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Non-Urgent failures will not inhibit rod motion.
B. Incorrect. Two channels required for the runback and rod stop.
C. Correct. One PR channel exceeds 103%.
D. Incorrect. There will be a Power Range Deviation alarm, but it will not prevent rod motion.

Technical Reference(s): 1OM-2.4 Alarm A4-66 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3 Objective 18 and 23.e (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	005AA2.03	
	Importance Rating	3.5	4.4

Ability to determine and interpret the following as they apply to the inoperable / Stuck Control Rod: Required actions if more than one rod is stuck or inoperable.

Proposed Question: Common 44

Given the following conditions:

A load rejection has occurred from 100% power. The Unit has stabilized at 82% power.

- The RO determines that 2 Control Bank "D" rods did not move during the load rejection.
- The rods are approximately 16 steps above the remainder of Control Bank D.
- The Urgent Failure and Non-Urgent Failure alarms are NOT lit.

Which one of the following describes the required action for this condition?

A. Initiate a boration to increase Shutdown Margin by an amount equal to the stuck rod worth, and align the remainder of Control Bank "D" rods with the stuck rods.

B. Initiate boration to increase Shutdown Margin by an amount equal to the stuck rod worth, and commence a plant shutdown to Mode 3.

C. Trip the reactor and commence boration to achieve adequate Shutdown Margin in accordance with ES-0.1, Reactor Trip Response.

D. Trip the reactor and commence emergency boration in accordance with FR-S.1, Response to Nuclear Power Generation/ATWS.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Would not withdraw remainder of Bank "D" to match stuck rods, although action in the AOP for misaligned rods lower than the bank would require realignment.

B. Correct.

C. Incorrect. Trip conditions do not exist. If 2 rods were dropped, then a trip would be

required.

D. Incorrect. Reactor trip not required, would not use FR-S.1 to borate.

Technical Reference(s): AOP-1.1.8 step 4 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3, Objective 23.e and 25 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	011EK2.02	
	Importance Rating	2.6	2.7

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

Proposed Question: Common 45

The Unit is at 60% power.

- [1SI-P-1A], LHSI Pump "A" is out of service. Expected to return to service in 3 hours.
- [1QS-P-1A], Quench Spray Pump "A" is out of service. Expected to return to service in 6 hours.

A large break LOCA occurs. The crew takes action in accordance with E-1, Loss of Reactor or Secondary Coolant.

The following conditions currently exist:

- Containment pressure 32 psig, DECREASING slowly
- RCS pressure 100 psig, STABLE
- Pressurizer level Off-Scale LOW

All actuations have occurred as required.

If the RWST was at its minimum level for operability when the event occurred, approximately how much time will pass before transition to ES-1.3, Transfer to Cold Leg Recirculation, is required?

A. One hour

B. Two hours

C. Three hours

D. Four hours

Proposed Answer: A

Explanation (Optional):

A. Correct. One train of LHSI will deliver 3000 GPM. One train of QSS will deliver 2500

GPM. 2 trains of HHSI will deliver approximately 1000 GPM. TS minimum is approximately 440,000 gallons (50 ft). Swapover is at approximately 170,000 gallons (19 ft).

B. Incorrect.

C. Incorrect.

D. Incorrect.

Distractors placed for symmetrical time periods.

Technical Reference(s): Tank Curves QS-TK-1 (Attach if not previously provided)
1OM11.1.C, 1OM13.1.C
TS section 3.4, E-1 CA summary

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-11.1 Objective 16 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	015/017AA2.11	
	Importance Rating	3.4	3.8

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): When to jog RCPs during ICC

Proposed Question: Common 46

Which one of the following describes the operation of RCP's during the performance of FR-C.1, Response to Inadequate Core Cooling?

A. If RCPs are available, they are started early in the event to provide forced flow ONLY if seal injection and CCR are available.

B. If RCPs are available, they are started early in the event to provide forced flow EVEN IF seal injection and CCR are NOT available.

C. At least 1 RCP is started to provide forced flow and mixing of RCS water after secondary depressurization has resulted in SI Accumulator Injection.

D. At least 1 RCP is started to provide forced flow of the RCS when secondary depressurization is ineffective in restoring adequate core cooling.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. RCPs will not be running for this event, but they will be started later if other methods to restore core cooling have failed, regardless of support system status.
B. Incorrect. RCPs will be started later in the event if other methods are ineffective.
C. Incorrect. If secondary depressurization restores core cooling via accumulator injection, RCP operation is unnecessary.
D. Correct.

Technical Reference(s): FR-C.1 Background pg 3, 48, 50, 51 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.2, Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	024AA1.07	
	Importance Rating	3.3	3.4

Ability to operate and/or monitor the following as they apply to the Emergency Boration: BWST level.

Proposed Question: Common 47

Given the following conditions:

- An ATWS has occurred.
- The crew is performing the actions of FR-S.1, Response to Nuclear Power Generation/ATWS.
- The RO has initiated emergency boration.
- All equipment has operated as designed.
- SI is NOT actuated.
- RCS pressure is 2210 psig and trending DOWN.
- Tavg is 567°F and trending DOWN.

Which one of the following describes plant response to initiation of the boration?

A. Boric Acid Tank level will be dropping at a rate approximately equal to charging flow.

B. Volume Control Tank level will be dropping at a rate approximately equal to charging flow.

C. Refueling Water Storage Tank level will be dropping at a rate approximately equal to charging flow.

D. Pressurizer level will be rising at a level approximately equal to charging flow.

Proposed Answer: A

Explanation (Optional):

A. Correct. BAT will be supplying borated water if everything works properly.
B. Incorrect. VCT level may actually be rising because there is no outflow, and Letdown may still be flowing.
C. Incorrect. RWST not supplying any water unless equipment does not work properly or

SI is initiated.

D. Incorrect. In a transient like an ATWS, pressurizer level will also be in a transient state, due to RCS mass changing from temperature changing.

Technical Reference(s): FR-S.1 Step 7 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53.3 Objective 2 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	026AA1.01	
	Importance Rating	3.1	3.1

Ability to operate and/or monitor the following as they apply to the Loss of Component Cooling Water: CCW/nuclear service water temperature indications.

Proposed Question: Common 48

Given the following conditions:

- The Unit is in Mode 5.
- [1CC-E-1A], CCR Heat Exchanger "1A", is in service.
- [TCV-1CC-100], CCR Temperature Control Valve is in MANUAL.
- The operating CCR pump trips on overcurrent.

Prior to any action by the crew, which one of the following describes system temperature response at the outlet of [1CC-E-1A] over the next 10 seconds?

A. River Water temperature will RISE
CCR temperature will RISE

B. River Water temperature will DROP
CCR temperature will DROP

C. River Water temperature will RISE
CCR temperature will DROP

D. River Water temperature will DROP
CCR temperature will RISE

Proposed Answer: B

Explanation (Optional):

A. Incorrect. When the CCR pump trips, flow in the CCR loop will drop. Heat will not be removed from RHR, so heat load in the system is temporarily reduced. The reduced flow will cause water in the heat exchanger to be cooled for a longer period by RW.

B. Correct.
C. Incorrect. RW continues to flow. Removing less heat will reduce the HX outlet temperature.
D. Incorrect. Less CCR flow against the same RW flow will drop temperature.

Technical Reference(s): 1OM15.1.C (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-15.1 Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	029EK2.06	
	Importance Rating	2.9	3.1

Knowledge of the interrelations between the ATWS and the following: Breakers, relays and disconnects.

Proposed Question: Common 49

Given the following conditions:

- Reactor Trip testing is in progress on Train "A".
- Reactor Trip Breaker "A" is open.
- Reactor Trip Bypass Breaker "A" is closed.
- A transient occurs requiring a reactor trip.
- The RO attempts to manually trip the reactor but the reactor does NOT trip.

Which one of the following describes a failure that has contributed to the reactor trip failure?

A. Reactor Trip Breaker "B" Trip relays failed to energize.

B. Reactor Trip Breaker "B" Shunt Trip relays failed to deenergize.

C. Reactor Trip Bypass Breaker "A" Trip relays failed to deenergize.

D. Reactor trip Bypass Breaker "B" Shunt Trip relays failed to energize.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. RTB "B" trip relays are normally energized. Deenergizes on trip signal.
B. Incorrect. Shunt trip energizes to trip the RTB.
C. Correct. RTB "B" trip relays act the same as RTB trip coils.
D. Incorrect. RTB "B" not equipped with a shunt trip.

Technical Reference(s): 1OM-1.1.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 2, 10, 11 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	067AA1.06	
	Importance Rating	3.5	3.7

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

Proposed Question: Common 52

Which one of the following fire alarms can be verified by checking that Annunciator [A11-123], MOTOR DRIVEN FIRE PUMP RUNNING, is lit?

A. [A8-6], Main Transformer

B. [A11-67], Cable Tray Mezzanine

C. [A11-65], Diesel Generator Building "A"

D. [A11-70], Turbine Generator Bearings and Enclosure

Proposed Answer: A

Explanation (Optional):

A. Correct. Main Transformer is a Water Spray Protected Area. When the HAD initiates water spray for the Main Transformer, the Motor Driven Fire Pump automatically starts on low fire main pressure.
B. Incorrect. CO_2 protected area.
C. Incorrect. CO_2 protected area.
D. Incorrect. CO_2 protected area.

Technical Reference(s): 1OM-33.4.AAA (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-33.1 Objective 11 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

Question Cognitive Level:	Memory or Fundamental Knowledge		
	Comprehension or Analysis	Comp	
10 CFR Part 55 Content:	55.41	X	
	55.43		

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
		068AA1.16	
	Importance Rating	3.2	3.3

Ability to operate and/or monitor the following as they apply to the Control Room Evacuation: Turbine throttle valve indicating lights and position indicators.

Proposed Question: Common 53

Given the following conditions:

- A small fire has developed in the Control Room.
- The Shift Manager has determined that Control Room evacuation is required.
- A manual reactor trip has been initiated, and all control rods have been verified fully inserted.

Which one of the following describes the minimum additional action required to verify Turbine Trip?

A. Verify turbine throttle valves all closed or verify governor valves all closed prior to exiting the control room.

B. Verify turbine throttle valves all closed and verify governor valves all closed prior to exiting the control room.

C. Verify turbine throttle valves all closed or verify governor valves all closed in the Turbine Building prior to manning the Emergency Shutdown Panel.

D. Verify turbine throttle valves all closed and verify governor valves all closed in the Turbine Building prior to manning the Emergency Shutdown Panel.

Proposed Answer: A

Explanation (Optional):

A. Correct. In accordance with AOP-1.33.1A, Control Room Inaccessibility, the turbine trip is verified prior to leaving the control room by checking throttle valves all closed OR governor valves all closed.
B. Incorrect. Only required to check one or the other.
C. Incorrect. Checked in control room.
D. Incorrect. Checked in control room, and only one set of valves required.

Technical Reference(s): AOP-1.33.1A (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1/2SQS-53C.1 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
		074EA2.08	
	Importance Rating	3.8	4.6

Ability to determine or interpret the following as they apply to Inadequate Core Cooling: The effects of turbine bypass valve operation on RCS temperature and pressure.

Proposed Question: Common 54

Given the following conditions:

- The Unit was operating at 100% power.
- Reactor trip occurred due to a LOCA.
- All safety injection systems failed to operate.
- FR-C.1, Response To Inadequate Core Cooling, has been entered.
    - The Unit Supervisor has directed the depressurization of all intact steam generators to 150 psig using the condenser steam dumps.
    - All MSIVs are open and the condenser is available.
    - The steam dump controller (AM-1MS-464B) is in manual.
    - The steam dump control mode selector switch is in the STM PRESS position, and steam generator depressurization is underway.
    - PRZR pressure is > 1950 psig, and the Block Steamline SI Switches have NOT been placed in the BLOCK position.
    - As the steam generator depressurization progresses, the steam flow automatically stops.

Which one of the following has caused the steam flow to stop?

A. Steam generator pressure has reached 150 psig or Main Steamline Isolation due to exceeding the high steam pressure rate setpoint.

B. Steam header pressure has dropped below the setpoint on [AM-1MS-464B] or Tavg is below 541°F and no action has been taken to defeat the Tavg Interlock.

C. Tavg is below 541°F and no action has been taken to defeat the Tavg Interlock or Main Steamline Isolation due to exceeding the high steam pressure rate setpoint.

D. Main Steamline Isolation due to exceeding the high steam pressure rate setpoint or Steam header pressure has dropped below the setpoint on [AM-1MS-464B].

Proposed Answer: C

Explanation (Optional):

A. Incorrect. No automatic actions halt steam dump at 150 psig.
B. Incorrect. AM-1MS-464B is in manual. Pressure setpoint has no effect.
C. Correct. As Tavg approaches 541°F, the Tavg Interlock must be defeated by holding both steam dump control bypass interlock selector switches to the DEFEAT TAVG NTLK position until the status light, "2/3 Lo-Lo Tavg" is LIT. This action was not performed. Also, the Main Steamline Isolation due to exceeding the high steam pressure rate setpoint is active and could have resulted in an MSIV isolation if the rate of depressurization was excessive.
D. Incorrect. AM-1MS-464B is in manual. Pressure setpoint has no effect.

Technical Reference(s): FR-C.1 Step 16 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	E01EK1.3	
	Importance Rating	3.1	3.5

Knowledge of the operational implications of the following concepts as they apply to the (Reactor Trip or Safety Injection/Rediagnosis): Annunciators and conditions indicating signals and remedial actions associated with the (Reactor Trip or Safety Injection/Rediagnosis).

Proposed Question: Common 55

Given the following conditions:

- A Reactor Trip and Safety Injection have occurred.
- The crew was performing action contained in E-1, Loss Of Reactor or Secondary Coolant.
- The Unit Supervisor was concerned about conflicting indications, and the crew entered ES-0.0, Rediagnosis.
- The crew determines that there is an increasing trend on [RM-1MS-101], FW-P-2 Monitor and [RM-1MS-100A], Steam Relief Monitor.

Which one of the following describes how the crew will transition to the correct procedure?

A. Go directly to the appropriate E-3 or ECA-3 series procedure.

B. Return to E-0 diagnostic steps to verify indications that will confirm the event in progress.

C. Return to E-1 step in effect and use the Symptomatic Response/Unexpected Conditions page to direct entry to E-3.

D. Direct Chemistry sample of steam generators to confirm radiation monitor readings prior to making a determination of appropriate procedure entry.

Proposed Answer: A

Explanation (Optional):

A. Correct. ES-0.0 Step 3.
B. Incorrect. Once in ES-0.0, transition back to E-0 will not be made.
C. Incorrect. Once E-1 is exited, ES-0.0 will direct entry to the appropriate procedure.
D. Incorrect. Procedure is entered without the need of a confirmatory sample.

Technical Reference(s): ES-0.0, Step 3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	1
	K/A #	E02EK1.3	
	Importance Rating	3.5	3.8

Knowledge of the operational implications of the following concepts as they apply to the (SI Termination): Annunciators and conditions indicating signals and remedial actions associated with the (SI Termination).

Proposed Question: Common 56

Given the following conditions:

- A Steam Line Break has occurred.
- All equipment actuated as required.
- The crew has isolated the faulted steam generator.
- The Unit Supervisor has directed transition to ES-1.1, SI Termination.
- SI, CIA, and CIB have been reset.
- RCS pressure is 1775 psig and rising slowly.
- There are NO other indications of RCS leakage.

Which one of the following describes the sequence of steps that will stop the SI pumps?

A. Stop 1 HHSI pump
Check RCS pressure stable and align normal Charging
Stop BOTH LHSI pumps

B. Stop 1 HHSI pump
Check RCS pressure stable and align normal Charging
Stop 1 LHSI pump. Ensure RCS pressure remains stable, then stop the second LHSI pump

C. Align normal Charging
Check RCS pressure stable and stop 1 HHSI pump
Stop BOTH LHSI pumps

D. Align normal Charging
Check RCS pressure stable and stop 1 HHSI pump
Stop 1 LHSI pump. Ensure RCS pressure remains stable, then stop the second LHSI pump

Proposed Answer: A

Explanation (Optional):

A. Correct. HHSI stopped first because termination criteria is met and do not want to overfill pressurizer. With RCS pressure greater than 1700 psig, there is no LHSI flow, and stopping both pumps is required.

B. Incorrect. Pressure will not change after stopping 1 LHSI pump with RCS pressure >250 psig. There is no LHSI flow to change RCS parameters.

C. Incorrect. Do not align normal charging until after it is determined that RCS pressure is stable with only 1 charging pump in operation.

D. Incorrect. Do not align normal charging until after it is determined that RCS pressure is stable with only 1 charging.

Technical Reference(s): ES-1.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X

55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		007EA2.04	
	Importance Rating	4.6	4.4

Ability to determine or interpret the following as they apply to a reactor trip: If reactor should have tripped but has not done so, manually trip the reactor and carry out actions in ATWS EOP.

Proposed Question: Common 58

The Unit is operating at 100% power when the following conditions occur:

- A PRZR spray valve sticks open and PRZR pressure has lowered to 1800 psig.
- Reactor Trip Breakers are SHUT.
- Neutron flux is NOT dropping.

Which one of the following describes an Immediate Manual Action?

A. Verify AFW status.

B. Verify MSL Isolation.

C. Isolate Condenser Steam Dump Valves.

D. Initiate Emergency Boration of the RCS.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Performed after Immediate Actions are complete.
B. Incorrect. Performed after Immediate Actions are complete.
C. Correct. Operator Immediate Action is to place both Steam Dump Control Interlock Selector Switches in the OFF position to isolate the condenser steam dump valves.
D. Incorrect. Performed after Immediate Actions are complete.

Technical Reference(s): FR-S.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		008AA2.20	
	Importance Rating	3.4	3.6

Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: The effect of an open PORV on code safety, based on observation of plant parameters.

Proposed Question: Common 59

With the Unit operating at 100% power, the reactor trips on low Pressurizer pressure.

Pressurizer Relief Tank pressure indicates 15 psig on PI-1RC-472. The crew suspects that a PORV opened inadvertently and is now stuck partially open.

Which one of the following confirming indications could be expected if a PORV is stuck partially open?

A. PORV relief line temperature stabilized at 213°F. PRZR Safety relief line temperatures indicate 180°F and very slowly rising.

B. PORV relief line temperature stabilized at 250°F. PRZR Safety relief line temperatures indicate 217°F and very slowly rising.

C. PORV relief line temperature stabilized at 213°F. PRZR Safety relief line temperatures indicate 110°F and stable.

D. PORV relief line temperature stabilized at 250°F. PRZR Safety relief line temperatures indicate 110°F and stable.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. 213°F is the saturation temperature corresponding to 15 psia.
B. Correct. 250°F is the saturation temperature corresponding to 30 psia (15 psig PRT pressure = 30 psia). Safety relief line temperatures would be rising because they share a common discharge line to the PRT with the PORVs.
C. Incorrect. 213°F is the saturation temperature corresponding to 15 psia. Also, safety relief line temperatures would be rising because they share a common discharge line to the PRT with the PORVs.
D. Incorrect. 250°F is the saturation temperature corresponding to 30 psia (15 psig PRT pressure = 30 psia); however, safety relief line temperatures would be rising because they share a common discharge line to the PRT with the PORVs.

Technical Reference(s): Steam Tables (Attach if not previously provided)
1OM6.4 Annunciator response

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

Learning Objective: 1SQS-6.4 Objectives 19/20 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	2
		027AA2.07	
	Importance Rating	3.1	3.1

Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunctions: Makeup flow indication.

Proposed Question: Common 60

Given the following conditions:

- The Unit is at 100% power, steady state. All systems are in NSA.
- Pressurizer level is on program and stable.
- Pressurizer pressure is 2235 psig and stable.
- Charging flow on [FI-1CH-122] indicates 70 GPM.

A malfunction results in the loss of Pressurizer heaters. When heaters are restored, the following conditions exist:

- Pressurizer level is on program and stable.
- Pressurizer pressure is 2000 psig.

Which one of the following describes the approximate value for charging flow indication on [FI-1CH-122]?

A. 0 GPM

B. 60 GPM

C. 70 GPM

D. 80 GPM

Proposed Answer: B

Explanation (Optional):

A. Incorrect. No flow would indicate that charging flow was lost or isolated. There is no condition present for charging flow to be isolated.

B. Correct. Slightly lower flow due to the slightly lower DP between the RCS and the VCT causing letdown flow to be less. The charging flow control valve will compensate to reduce makeup.

C. Incorrect. Charging flow will not remain constant if letdown flow changes.

D. Incorrect. Charging flow will not rise unless either RCS pressure rises or there is a leak in the RCS.

Technical Reference(s): Simulator Response (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-7.1 Objective 19 (As available)

Question Source: Bank #

Modified Bank # 1LOT4 NRC Exam #27 (Note changes or attach parent)

New

Question History: 1LOT4 NRC (Modified)

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X

55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		032AK3.01	
	Importance Rating	3.2	3.6

Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Startup termination on source-range loss.

Proposed Question: Common 61

Given the following conditions:

- A reactor startup is in progress.
- Both Intermediate Range channels indicate approximately 5 E^{-11} amps.
- Source Range channel N-31 fails downscale.

Which one of the following describes the required operator response and the reason for the response?

A. Suspend the reactor startup; with only one source range channel operable, the minimum required Source Range High Flux Trip protection is not met.

B. Continue the reactor startup; with only one source range channel operable; 48 hours is allowed to restore two channels to service.

C. Suspend the reactor startup; source range channels are not required to trip the reactor; however, the source range monitoring functions must be available.

D. Continue the reactor startup; the Intermediate Range Neutron Flux Trip and the Power Range Neutron Flux-Low Trip provide the necessary core protection.

Proposed Answer: A

Explanation (Optional):

A. Correct. When in Mode 2, below P-6, and performing a reactor startup, if one source range neutron flux channel becomes inoperable, operations involving positive reactivity addition must be immediately suspended. This precludes any power escalation. With only one source range channel operable, core protection is severely reduced.
B. Incorrect. Cannot continue to Mode 1 or go above P-6.
C. Incorrect. Source Range is required for Rx Trip.
D. Incorrect. May not continue, and PR High Flux Low Setpoint is not enabled.

Technical Reference(s): AOP-1.2.1a (Attach if not previously provided)
TS 3.4.3.1 Basis

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53C.1 Objective 7 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		009EA1.01	
	Importance Rating	4.4	4.3

Ability to operate and/or monitor the following as they apply to Small Break LOCA: RCS Pressure and Temperature

Proposed Question: Common 62

Given the following conditions:

- A Small Break LOCA has occurred.
- The crew is performing the actions of ES-1.2, Post LOCA Cooldown And Depressurization.
- Safety Injection pumps have been stopped.
- Normal charging is aligned.
- The crew is depressurizing the RCS using normal spray.

Which one of the following describes the strategy for the continuing depressurization?

A. Maximize subcooling to ensure continued RCP operation.

B. Minimize subcooling to reduce RCS break flow.

C. Maximize subcooling to prevent a challenge to the Core Cooling CSF.

D. Minimize subcooling to ensure pressurizer level remains above the lower limit to allow heater operation during the RCS cooldown.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. RCP operation is not required for this event, although desired.

B. Correct. Strategy is to depressurize and attempt to minimize subcooling so that break flow is reduced, due to the minimal makeup provided by charging pumps.

C. Incorrect. Core cooling should not be challenged on loss of subcooling at these temps and pressures (this point in the cooldown).

D. Incorrect. Heater operation may be required to reduce the rate of increase in pressurizer level, but is not the reason for minimizing subcooling.

Technical Reference(s): ES-1.2 Background (Attach if not previously provided)
ES-1.2 Step 23

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

Question Source: Bank # X(Vendor Bank)
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	037AK3.05	
	Importance Rating	3.7	4.0

Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak: Actions contained in procedures for radiation monitoring, RCS water inventory balance, S/G tube failure, and plant shutdown.

Proposed Question: Common 63

Given the following conditions:

The Unit is at 100% power. All systems are in NSA.

The following alarms are received in the Control Room:

- [RM-1SV-100], Condenser Air Ejector Vent High
- [RM-BD-101], High Capacity SG Blowdown High-High
- [RM-1MS-102A], N-16 Steam Generator "A" Leak Monitor High-High

[RM-BD-101] and [RM-1MS-102A] are stable at or near their alarm setpoints. [RM-1SV-100] is stable above the High alarm setpoint.

Which one of the following describes the significance of the alarm status listed above?

A. The two radiation monitors in High-High alarm provide the threshold for tripping the reactor and initiating Safety Injection.

B. The alarm status of the radiation monitors give an approximate value for RCS primary-to-secondary leak rate.

C. The rate of increase of any of the three radiation monitors provides the threshold for tripping the reactor and initiating safety injection.

D. The alarm status of the radiation monitors determines the course of action taken on the charging and letdown system to provide an accurate estimate of the leak rate.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The threshold is inability to maintain pressurizer level. With all radiation monitors at high or high-high, leak rate is only 75 GPD.

B. Correct.

C. Incorrect. Pressurizer level provides threshold. Rate of increase can indicate increase in leak size, but does not provide the actual action.

D. Incorrect. Charging and letdown are manipulated on pressurizer level response.

Technical Reference(s): AOP-1.6.4 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53C.1 Objective 7 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		038EA2.07	
	Importance Rating	4.4	4.8

Ability to determine or interpret the following as they apply to a SGTR: Plant conditions, from survey of Control Room indications

Proposed Question: Common 64

Given the following conditions:

- The Unit was operating at 100% power when a reactor trip occurred on low pressurizer pressure.
- A Steam Generator Tube Rupture was diagnosed and E-3, Steam Generator Tube Rupture was entered.
- E-3, Step No. 31, "Control RCS Pressure and Charging Flow to Minimize RCS-To-Secondary Leakage" is being performed (attached).

Given the following control room indications:

- SG "C" Blowdown Sample indicates high radiation.
- SG "C" NR level is 32% and dropping.
- Feed flow has been isolated to SG "C".
- SG "A" and "B" levels are slowly lowering.
- PRZR level is 63% and rising.

Which one of the following describes the appropriate operator action?

A. Depressurize RCS.

B. Lower charging flow.

C. Turn on PRZR heaters.

D. Depressurize RCS and lower charging flow.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. If ruptured SG level is rising with a lower PRZR level than exists, would depressurize RCS.
B. Incorrect. If PRZR level is greater than 75%, would lower charging.
C. Correct.
D. Incorrect. If ruptured SG level was rising, would perform both.

Technical Reference(s): E-3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: E-3, Step 31

Learning Objective: 3SQS-53.3 Objective 2 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Number E-3	Title Steam Generator Tube Rupture	Issue 1C Revision 2

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

****

CAUTION

RCS and ruptured SGs pressures must be maintained less than the ruptured SGs atmospheric steam dump setpoint to prevent offsite releases.

****

NOTE

When letdown is in service, charging flow should be maintained greater than 30 GPM to ensure adequate letdown cooling and prevent letdown from flashing to steam.

31 Control RCS Pressure And Charging Flow To Minimize RCS-To-Secondary Leakage

a. Perform appropriate actions from table:

		RUPTURED SG NR LEVEL		
		RISING	DROPPING	OFFSCALE HIGH
PRZR LEVEL	LESS THAN 32% [50% ADVERSE CNMT]	• Raise charging flow • Depressurize RCS using Step 31.b	Raise charging flow	• Raise charging flow • Maintain RCS & ruptured SGs pressures equal
	BETWEEN 32% [50% ADVERSE CNMT] AND 50%	Depressurize RCS using Step 31.b	Turn ON PRZR heaters	Maintain RCS & ruptured SGs pressures equal
	BETWEEN 50% AND 75% [61% ADVERSE CNMT]	• Depressurize RCS using Step 31.b • Lower charging flow	Turn ON PRZR heaters	Maintain RCS & ruptured SGs pressures equal
	GREATER THAN 75% [61% ADVERSE CNMT]	Lower charging flow	Turn ON PRZR heaters	Maintain RCS & ruptured SGs pressures equal

(step continued next page)

SYMPTOMATIC RESPONSE/UNEXPECTED CONDITIONS

E-3 (Issue 1C, Revision 2)

1. SI REINITIATION CRITERIA

Manually operate SI pumps and align valves as necessary and GO TO ECA-3.1, "SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired", Step 1, if EITHER condition listed below occurs:

- On ICCM RCS subcooling based on core exit TCs - LESS THAN 46F [54F FOR ADVERSE CNMT] (If less, refer to Attachment 6-A)
- PRZR level - CANNOT BE MAINTAINED GREATER THAN 18% [37% FOR ADVERSE CNMT]

2. SECONDARY INTEGRITY CRITERIA

GO TO E-2, Faulted Steam Generator Isolation", Step 1, if any SG pressure is dropping in an uncontrolled manner or has completely depressurized, and has not been isolated unless needed for RCS cooldown.

3. COLD LEG RECIRCULATION SWITCHOVER CRITERION

GO TO ES-1.3, "Transfer Cold Leg Recirculation", Step 1, if RWST level reduces to less than 19 FEET.

4. AFW SUPPLY SWITCHOVER CRITERION

Monitor PPDWST [WT-TK-10] for AFW pumps supply. Upon reaching low level alarm, 27.5 FEET, refer to Attachment 2-H for makeup.

5. MULTIPLE TUBE RUPTURE CRITERIA

RETURN TO E-3, "Steam Generator Tube Rupture", Step 1, if any intact SG level rises in an uncontrolled manner or any intact SG has abnormal radiation.

6. ADVERSE CONTAINMENT CRITERIA

- CNMT pressure - GREATER THAN 5.0 PSIG

-OR-

- CNMT radiation on [RM-1RM-219A(B)] - GREATER THAN 1E+5 R/HR

-OR-

- Integrated CNMT radiation - GREATER THAN 1E+6 R

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	054AA2.08	
	Importance Rating	2.9	3.3

Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): Steam flow-feed trend recorder.

Proposed Question: Common 65

The Unit is at 50% power during a power increase to 100%.

The following alarms are received in the Control Room:

- 1A, 1B, 1C SG Level Deviation
- 1A, 1B, 1C SG Level Low

The PO determines the following for all 3 SGs:

- SG level is DECREASING
- Steam flow is STABLE
- Feed flow is DECREASING
- Feed Reg Valve positions are all going OPEN
- Feedwater header pressure is approximately 950 psig and trending DOWN slowly

Assuming NO action has been taken by the crew, which one of the following events is the likely cause of these indications?

A. Secondary Load Rejection

B. Loss of Feedwater

C. First Stage Pressure Transmitter PT-446 failed LOW

D. First Stage Pressure Transmitter PT-446 failed HIGH

Proposed Answer: B

Explanation (Optional):

A. Incorrect. On a load rejection, feedwater pressure would be rising, although the other indications may be present, depending on the severity.

B. Correct.

C. Incorrect. Feed Reg. Valves would initially go closed on a FSPT failure. When they went open due to level deviation, feedwater flow would rise.

D. Incorrect. Feed Reg. Valves would be going open until level took over to close them back down. Would not receive a SG low level for this failure.

Technical Reference(s): 1OM-24.4.IF (Attach if not previously provided)
AOP-1.24.1

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-24.1 Objective 17 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
		E05EK1.1	
	Importance Rating	3.8	4.1

Knowledge of the operational implications of the following concepts as they apply to the (Loss of Secondary Heat Sink): Components, capacity, and function of emergency systems.

Proposed Question: Common 68

Given the following conditions:

- A Loss of Heat Sink has occurred.
- The crew is establishing RCS 'Bleed and Feed' in accordance with FR-H.1, Loss Of Secondary Heat Sink.
- The RO opens one PORV. He reports that the other two PORVs will NOT open.

Which one of the following describes the consequences of the PORV failures?

A. A Red Path on the Core Cooling CSF will develop due to loss of RCS Inventory with no available makeup.

B. RCS 'Feed and Bleed' cooling must be established to ensure sufficient SI flow at the operable PORV setpoint.

C. The RCS may not depressurize quickly enough to ensure sufficient SI flow to provide RCS heat removal, and other RCS openings may have to be established.

D. 'Bleed and Feed' cooling of the RCS must be terminated and secondary depressurization to inject Condensate pump flow must be immediately initiated.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Although a red condition on Core Cooling may eventually occur, there is available makeup with HHSI.
B. Incorrect. Bleed and Feed is preferable, because SI flow may NOT be adequate at the PORV setpoint.
C. Correct.
D. Incorrect. Action to align condensate pumps is already taken, and not as a contingency to Bleed and Feed.

Technical Reference(s): 1OM-53B.4-FR-H.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
		036AA1.02	
	Importance Rating	3.1	3.5

Ability to operate and/or monitor the following as they apply to the Fuel Handling Incidents: ARM system.

Proposed Question: Common 69

Given the following conditions:

- The Unit is in Mode 6. All systems are in NSA.
- Refueling in progress. The Containment Equipment Hatch is closed.
  - [RIS-1RM-104A], Containment Purge Exhaust Monitor is in High-High alarm.
  - Containment Purge Supply and Exhaust Fans trip.
  - Containment Evacuation Alarm is sounding.

Which one of the following indications will provide direct confirmation of the event in progress?

A. [RIS-1RM-215A], Containment Particulate Monitor

B. [RIS-1VS-103A], Fuel Building Ventilation Exhaust Monitor

C. [RIS-1VS-107A], Elevated Release Particulate Monitor

D. [RM-1RM-218A], Control Room Radiation Monitor

Proposed Answer: A

Explanation (Optional):

A. Correct. Accident is inside Containment if purge is isolated.
B. Incorrect. Would be indicative of accident in Fuel Building.
C. Incorrect. Indicative of accident in Fuel Building.
D. Incorrect. Would possible alarm if equipment hatch was open.

Technical Reference(s): AOP-1.49.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53.1 Objective 7 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
		056AK3.02	
	Importance Rating	4.4	4.7

Knowledge of the reasons for the following responses as they apply to the Loss of Offsite Power: Actions contained in EOP for loss of offsite power.

Proposed Question: Common 70

As directed by ECA-0.0, Loss Of All AC Power, the crew places the charging pumps in Pull-To-Lock.

The defeat of the charging pump automatic start is to prevent...

A. an uncontrolled over-pressurization of the RCS, and the resulting increased loss of RCS inventory through the RCP seals when power is restored.

B. an excessive cooldown of the RCS due to injection of cold RWST water when power is restored.

C. the unnecessary use of water that may be needed for long term recovery.

D. a LOCA caused by thermal shock of the RCP seals when power is restored.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. RCS inventory could be controlled by the CVCS.
B. Incorrect. RWST water won't be used unless a safety injection occurs.
C. Incorrect. Charging draw on RWST is minimal.
D. Correct. RCP seals heat up as the RCS flow up and around the seal package due to a loss of seal injection and seal cooling, then a sudden injection of seal water could thermally shock the seal package.

Technical Reference(s): 1OM-53B.4.ECA-0.0 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # X

Modified Bank # _____ (Note changes or attach parent)

New _____

Question History: Old North Anna Exam

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 X

55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
		072A2.01	
	Importance Rating	2.7	2.9

Ability to (a) predict the impacts of the following malfunctions or operations on the ARM System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Erratic or failed power supply.

Proposed Question: Common 84

Given the following conditions:

- Unit 1 is in Mode 6.
- Unit 2 is in Mode 1.
- Movement of irradiated fuel is ongoing in the Unit 1 Containment.
- [RM-1RM-218A], Control Room Area Monitor has failed LOW.
- The FAIL light for the radiation monitor is OFF.

What action is required for the above conditions?

A. No action is required because the monitor is not required to be operable.

B. Within ONE hour the respective Unit 2 control room monitor train shall be verified operable.

C. Within ONE hour verify that [RM-1RM-218B], Control Room Area Monitor is operable.

D. Within ONE hour, suspend all operations involving movement of irradiated fuel.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Two monitors required. Action 41 if one is INOPERABLE.
B. Correct.
C. Incorrect. One hour action is to verify Unit 2 is operable. Unit 1 is operable unless otherwise indicated.
D. Incorrect. Action for Unit 2 rad monitor INOPERABLE.

Technical Reference(s): TS table 3.3.6 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-43.1 Objective 9 (As available)

Question Source: Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: 1LOT3 2001 Audit #98

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:
One hour entry into TS action.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	2.2.25	
	Importance Rating		3.7

Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Proposed Question: SRO 36

Regarding Technical Specification SAFETY LIMITS, which one of the following core limitations does the OT Delta-T reactor trip prevent exceeding?

A. Power Density (KW/ft)

B. Departure from Nucleate Boiling (DNB)

C. Total Core Power

D. Axial Flux Difference (AFD)

Proposed Answer: B

Explanation (Optional):

A. Incorrect. OP Delta-T trip limits power density.
B. Correct.
C. Incorrect. Power Range High Flux trip limits total core power.
D. Incorrect. Rod Insertion Limits assist in maintaining AFD within limits.

Technical Reference(s): TS Bases, 3.3.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.1 Objective 16 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 2 because the SRO must understand LSSS and basis for protection of Safety Limits.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	040G2.2.22	
	Importance Rating		4.1

Equipment Control: Knowledge of limiting conditions for operations and safety limits.

Proposed Question: SRO 50

Given the following conditions:

- The Unit is at 100% power. All systems are in NSA..
- A Steam Line Break occurs downstream of MSIV "A".
- A Main Steam Line Isolation Signal is generated.

Which one of the following describes the maximum allowable closure time of the MSIVs and the associated reason?

A. The MSIVs must close within 5 seconds to limit the pressure rise inside Containment.

B. The MSIVs must close within 5 seconds to minimize the reactivity effects of the RCS cooldown.

C. The MSIVs must close within 30 seconds to limit the pressure rise inside Containment.

D. The MSIVs must close within 30 seconds to minimize the reactivity effects of the RCS cooldown.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The break is outside of containment if it is downstream of MSIV.
B. Correct.
C. Incorrect. 30 seconds is too long. Accident analysis assumptions would be violated. Containment Pressure would not be rising.
D. Incorrect. 30 seconds is too long. Accident analysis assumptions would be violated.

Technical Reference(s): TS 3.7.1.5 and basis (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-21.1 Objective 17 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) items 1 and 2 because the SRO is required to know the design basis function and TS operability requirements of the MSIVs.

PLANT SYSTEMS

MAIN STEAM LINE ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.7.1.5 Each main steam line isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

MODES 1 - With one main steam line isolation valve inoperable but open, POWER OPERATION may continue provided the inoperable valve is restored to OPERABLE status within 4 hours;

Otherwise, be in HOT SHUTDOWN within the next 12 hours.

MODES 2 and 3 - With one main steam line isolation valve inoperable, subsequent operation in MODES 2 or 3 may proceed after:

a. The inoperable isolation valve is restored to OPERABLE status, or

b. The isolation valve is maintained closed;

Otherwise, be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.7.1.5 Each main steam line isolation valve shall be demonstrated OPERABLE by verifying full closure within 5 seconds when tested pursuant to Specification 4.0.5.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that steam releases to the environment will not be significant contributors to radioactivity releases resulting from analyzed accidents. Many of the analyzed accidents assume that a loss of auxiliary AC power occurs, making the main condenser unavailable for plant cooldown, and making it necessary to dump steam to the environment via SG atmospheric dump valves. Maintaining secondary system specific activity within the limits ensures that these releases, in conjunction with other releases associated with the accident, will be within applicable dose criteria.

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVES

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blowdown in the event of a steam line rupture. This restriction is required to 1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and 2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the surveillance requirements are consistent with the assumptions used in the accident analyses.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
		057G2.4.31	
	Importance Rating		3.4

Emergency Procedures / Plan: Knowledge of annunciators alarms and indications, and use of the response instructions.

Proposed Question: SRO 51

Given the following conditions:

- The Unit is operating at 100% power. All systems are in NSA.
- The following alarm is received in the Control Room:
  - [A1-10], VITAL BUS 1 TROUBLE
- The crew determines that NI Rack Channel 1 is deenergized.
- DC Bus 1 indicates approximately 125 volts.

Which one of the following actions is required?

A. Trip the reactor; enter E-0, Reactor Trip Or Safety Injection.

B. Trip the reactor; enter E-0 and defeat Containment Pressure Bistable Channel 1 to inhibit CIB.

C. Restore Vital Bus 1 by bypassing the inverter; control plant parameters manually as necessary in accordance with 1OM-38.4.AAA, Vital Bus 1 Trouble.

D. Restore Vital Bus 1 by aligning to DC Bus 1; remove inverter from service and restore letdown in accordance with 1OM-38.4.AAA.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. No indication that reactor trip is required.
B. Incorrect. No indication that reactor trip is required. Only defeat CIB if another channel was bypassed or tripped.
C. Correct. Perform both sections of annunciator response. First section for controlling plant parameters, second section for restoring power to bus.
D. Incorrect. DC bus should have already been aligned. This is where the problem

originated. DC power is supplied to input side of inverter, with regulated AC on back side of static transfer switch.

Technical Reference(s): 1OM-38.AAA (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53C.1 Objective 5 and 7 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must evaluate plant conditions and determine the appropriate procedure direction.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	005 G2.1.33	
	Importance Rating		4.0

Ability to recognize indications for system operating parameters which are entry level conditions for Technical Specifications

Proposed Question: SRO 57

In accordance with Technical Specifications, which ONE of the following conditions will result in the declaration of an INOPERABLE control rod?

A. AFD exceeding operating limits.

B. A rod bottom light remains extinguished after a trip.

C. Control Bank "D" rods are trippable but cannot be moved electrically.

D. One Control Bank "D" rod indicates 210 steps with bank demand at 200 steps.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. AFD out of limit may be caused by excessive control rod movement, but is not the result of an inoperable rod or bank.
B. Incorrect. Rod bottom lights not required by TS, and if rod is within 12 steps of the bottom, it would still be considered operable.
C. Correct. Indication of Urgent Failure alarm. Would enter TS 3.1.3.1 Action C.
D. Incorrect. Requires 12 step difference to be declared inoperable.

Technical Reference(s): Technical Specifications 3.1.3.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3 Objective 25 and 27 (As available)

Question Source: Bank #

Modified Bank # (Note changes or attach parent)

New	X

Question History:

Question Cognitive Level:

Memory or Fundamental Knowledge	X
Comprehension or Analysis	

10 CFR Part 55 Content:

55.41	
55.43	X

Comments:
10CFR55.43(b) item 2 because it requires the SRO to recognize TS entry conditions.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
		058G2.1.23	
	Importance Rating		4.0

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation

Proposed Question: SRO 66

Given the following conditions:

- The Unit is at 100% power. All systems are in NSA.
- The following annunciators are received in the Control Room:
  - [A9-97], 125VDC BUS 1 DC SUPPLY ACB OVERCURRENT TRIP
  - [A9-98], 125VDC BUS 1 VOLTAGE LOW
  - [A9-100], 125VDC BATTERY CHGR 1 FAILURE
- 125 Volt DC Bus 1 voltage indicates 0 volts.
- The crew enters AOP-1.39.1, Loss of 125VDC Bus.

Which one of the following describes the action required for this condition?

A. Perform 1OM-39.4.AAI, 125VDC Bus 1 Voltage Low to restore DC Bus 1.

B. Enter E-0, Reactor Trip Or Safety Injection, and concurrently perform 1OM-39.4.AAI upon completion of Immediate Manual Actions.

C. Enter E-0, Reactor Trip Or Safety injection, and perform 1OM-39.4.AAI when directed to go to procedure and step in effect at the completion of ES-0.1, Reactor Trip Response.

D. Perform 1OM-39.4.G, Loss of Battery Charger, to restore power to DC Bus 1.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Reactor trip requires entry to E-0. RCP CCR cooling lost, other components... 1.39.1 directs manual reactor trip.
B. Correct.
C. Incorrect. 1.39.4.AAI action required to assist in stabilizing plant. May be used concurrently.
D. Incorrect. Action would be required if only the charger failure annunciator was lit. With

the others lit, direction is provided to use other ARP.

Technical Reference(s): AOP-1.39.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53.C.1 Objective 5 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must assess failures present and determine appropriate procedure entry.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
		038EA1.16	
	Importance Rating		4.3

Ability to operate and/or monitor the following as they apply to SGTR: SG atmospheric relief valve and secondary PORV controllers and indicators

Proposed Question: SRO 67

Given the following conditions:

- A Steam generator Tube Rupture has occurred on the "A" SG.
- All equipment is operating as designed.
- "A" SG has been isolated. The following indications exist:
  - "A" SG pressure is 1000 psig and trending UP.
  - "A" SG NR level is 55% and trending UP.

Which one of the following describes how pressure will be controlled on "A" SG prior to completion of the RCS depressurization?

A. Automatically at the Condenser Steam Dump pressure setpoint.

B. Automatically at the first SG Safety Valve setpoint.

C. Manually using the SG Atmospheric Dump Valve controller.

D. Manually by performing secondary depressurization to cool down the RCS below initial target temperature.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. SG is isolated from condenser and other SGs.
B. Incorrect. Do not rely on SVs for pressure control.
C. Correct.
D. Incorrect. Intact SGs are depressurized. If ruptured SG depressurized, would increase leak rate.

Technical Reference(s): E-3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		3
		028AA2.06	
	Importance Rating		2.8

Ability to determine and interpret the following as they apply to Pressurizer level control malfunctions: Letdown Flow indicator

Proposed Question: SRO 71

Given the following conditions:

- The Unit is at 100% power. All systems are in NSA.
- [TV-1CH-200B], Letdown Orifice Isolation Valve is aligned for service.
- [LT-1RC-459], Pressurizer Level Transmitter fails off-scale LOW.
- The RO places the PRZR Level Channel Sel SW to the correct position.

Which one of the following describes the effect on the plant and the additional action required to stabilize the plant?

A. Letdown flow will indicate 60 GPM. Turn off backup heaters and adjust charging flow as necessary.

B. Letdown flow will indicate 0 GPM. Manually energize backup heaters as necessary and establish excess letdown.

C. Letdown flow will indicate 45 GPM. Turn off backup heaters and establish excess letdown.

D. Letdown flow will indicate 0 GPM. Manually energize backup heaters as necessary and establish normal letdown.

Proposed Answer: D

Explanation (Optional):

A. Incorrect. Letdown will isolate. Action is for LT-459 failing HIGH.
B. Incorrect. Flow is correct but excess L/D not necessary because normal L/D is available.
C. Incorrect. Letdown will isolate and 200B is a 60 GPM orifice.
D. Correct.

Technical Reference(s): 1OM-6.4.IF (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-6.4 Objectives 19 and 21 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must determine the correct procedure usage based on evaluation of plant conditions.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
		E05EA2.2	
	Importance Rating		4.3

Ability to determine and interpret the following as they apply to the (Loss of Secondary Heat Sink): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: SRO 72

The crew is responding to a Loss Of Heat Sink per FR-H.1, Response To Loss Of Secondary Heat Sink.

- All SG wide range levels are offscale low.
- 'Bleed and Feed' has been established.
- RCS temperature is approximately 588°F and rising slowly.

Which one of the following describes the preferred method of initiating auxiliary feedwater flow for these conditions?

A. Feed 1 SG at the highest possible rate to reestablish SG inventory and secondary heat sink.

B. Feed all SGs at the highest possible rate to establish conditions for natural circulation.

C. Feed 1 SG at the minimum required flow to prevent possible SG tube failures.

D. Feed all SGs at the minimum required flow to establish a controllable cooldown rate and prevent loss of RCS inventory.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Only feed at maximum rate if feeding at minimum rate is ineffective.
B. Incorrect. Hot dry generators.
C. Correct. Feed at 100 gpm reason is correct.
D. Incorrect. Cooldown rate is not a priority. Priority is establishing a heat sink.

Technical Reference(s): 1OM-53B.4-FR-H.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

ES-401	Sample Written Examination Question Worksheet	Form ES-401-6

Learning Objective: 3SQS-53.3 Objective 2 and 3 (As available)

Question Source: Bank # X(Vendor Bank)
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must determine that a plant condition exists requiring specialized knowledge of the procedure usage. Then must determine the appropriate application of the procedure.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
		026AA2.02	
	Importance Rating		3.6

Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The cause of possible CCW loss.

Proposed Question: SRO 73

Given the following conditions:

- The Unit is in Mode 1 at 100% power.
- The crew is performing 1OM-15.4.H, Securing 'A' CCR Pump Or Placing The Spare CCR Pump In Service During Two Pump Operation, with the following system status:
  - [1CC-P-1B] "B" Component Cooling Pump is running.
  - [1CC-P-1C] "C" Component Cooling pump is racked on the 1AE 4KV Bus.
  - [1CC-P-1A] "A" Component Cooling Pump control switch is in Pull-To-Lock.

A loss of offsite power then occurs. The No. 2 EDG fails to start.

Two minutes later, the RO announces that annunciator [A6-35], PRI COMP COOL PUMP DISCH PRESS LOW is lit.

Which one of the following is causing annunciator [A6-35] to be lit?

A. [PCV-1CC-100] CCR pressure control valve has failed closed.

B. [1CC-P-1C] control switch is in After Start.

C. [1CC-P-1A] is still racked on the 1AE 4KV bus.

D. 1AE 4KV Stub Bus tie breaker 1E5 has opened as designed.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. If valve failed closed, discharge pressure would indicate high.
B. Incorrect. Switch position only relevant if only 1 breaker was racked in.
C. Correct. No auto start of "C" CCR if 2 pumps are racked in on same bus.
D. Incorrect. CCR pumps are powered from 1AE.

Technical Reference(s): 1OM15.4.H (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-15.1 Objectives 8 and 21 (As available)

Question Source: Bank # 1LOT4 NRC Exam #26

Modified Bank # (Note changes or attach parent)

New

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge

Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41 X

55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E08EA2.1	
	Importance Rating		4.2

Ability to operate and/or monitor the following as they apply to Pressurized Thermal Shock: Facility conditions and selection of appropriate procedures during abnormal and emergency operations

Proposed Question: SRO 74

Given the following conditions:

- A LOCA has occurred.
- The crew is performing actions contained in E-1, Loss Of Reactor Or Secondary Coolant.
- The following conditions currently exist:
  - All SI equipment is operating as required.
  - RCS pressure is 80 psig.
  - The STA informs you of the following CSF ORANGE conditions:
    - Integrity
    - Containment

Which one of the following describes the correct response to these indications?

A. Enter FR-P.1, Response To Imminent Pressurizer Thermal Shock Condition. Take action to stop RCS cooldown and reduce RCS pressure. When directed, enter FR-Z.1, Response To High Containment Pressure.

B. Enter FR-P.1, Response To Imminent Pressurizer Thermal Shock Condition. Ensure LHSI flow is consistent with RCS pressure. Transition to FR-Z.1, Response To High Containment Pressure.

C. Enter FR-Z.1, Response To High Containment Pressure. When action is complete, transition to FR-P.1, Response To Imminent Pressurizer Thermal Shock Condition. Take action to stop RCS cooldown and reduce RCS pressure, then return to E-1.

D. Enter FR-Z.1, Response To High Containment Pressure. When action is complete, transition to FR-P.1, Response To Imminent Pressurizer Thermal Shock Condition. Ensure LHSI flow is consistent with RCS pressure, then return to E-1.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. FR-P.1 actions do not apply if RCS pressure is low and RHR flow is high. A PTS event is not imminent.
B. Correct.
C. Incorrect. FR-P.1 is higher priority than FR-Z.1.
D. Incorrect. FR-P.1 is higher priority than FR-Z.1.

Technical Reference(s): FR-P.1 Step 2 (Attach if not previously provided)
1OM-53B.2

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS53.1 Objective 2.a (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must evaluate conditions, determine appropriate procedure sequence, and also use of applicable procedures.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E10EA2.1	
	Importance Rating		3.9

Ability to determine and interpret the following as they apply to the (Natural Circulation with Steam Void in Vessel with/without RVLIS): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Proposed Question: SRO 75

Given the following conditions:

- A reactor trip has occurred due to a loss of offsite power.
- The crew is performing actions of ES-0.2, Natural Circulation Cooldown.
- Train "A" of RVLIS is Out of Service.
- The crew has commenced RCS cooldown and depressurization.
  - RCS pressure is 1780 psig and trending DOWN.
  - RCS Tavg is 448°F and trending DOWN.
  - The RO determines that a safety valve on SG "A" is partially failed open.
  - RCS cooldown rate is approximately 40°F/Hr and CANNOT be reduced.
  - Pressurizer level is 35% and trending UP slowly.

Which one of the following actions will be required in accordance with ES-0.2?

A. Repressurize the RCS to minimize void growth.

B. Initiate Safety Injection and transition to E-0, Reactor Trip Or Safety Injection.

C. Transition to ES-0.3, Natural Circulation With Steam Void In Vessel (With RVLIS).

D. Transition to ES-0.4, Natural Circulation With Steam Void In Vessel (Without RVLIS).

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Do not raise pressure when cooldown is uncontrolled at this rate.

B. Incorrect. No SI requirements met. Subcooling is high and PRZR level is high. Potential PTS event if SI is initiated.

C. Correct. Cooldown cannot be maintained less than 25°F/Hr.

D. Incorrect. RVLIS is available (Train 'B').

Technical Reference(s): ES-0.2, Step 14 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 2 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must evaluate conditions and select procedure that applies to the event in progress.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E09EA2.2	
	Importance Rating		3.8

Ability to determine and interpret the following as they apply to the (Natural Circulation Operations): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: SRO 76

Given the following conditions:

- The reactor has tripped.
- A loss of offsite power subsequently occurs.
- The crew has transitioned to ES-0.2, Natural Circulation Cooldown.
- Letdown is isolated and cannot be restored.
- The RO is commencing boration to shutdown boron concentration.

Which one of the following describes the method of ensuring sufficient boration under these conditions?

A. Commence cooldown to allow additional inventory addition and maintain pressurizer level greater than 22%.

B. Maintain a small amount of pressurizer spray flow to ensure mixing of pressurizer and RCS.

C. Allow pressurizer level to rise to no higher than 75% to accommodate the boric acid volume required.

D. Commence depressurization using normal spray flow to allow for additional RCS makeup flow from CVCS.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Cannot commence cooldown until boron concentration is verified.

B. Incorrect. Mixing pressurizer and RCS may help prevent unwanted reactivity excursions during pressurizer outsurge, but sufficient boration is only assured by adding sufficient quantity.

C. Correct. Note prior to step 3 of ES-0.2.
D. Incorrect. Depressurization prior to cooldown would result in loss of subcooling.

Technical Reference(s): ES-0.2 step 3 Note (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 3 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
		068AA2.05	
	Importance Rating		4.3

Ability to determine and interpret the following as they apply to the Control Room Evacuation: Availability of heat sink.

Proposed Question: SRO 77

The Control Room has been evacuated due to a fire. The crew is performing the actions of 1OM-56C.4.B, Alternate Safe Shutdown Outside Control Room, using Train "B" equipment.

SG narrow range levels are 10% and trending DOWN in all 3 SGs.

Which one of the following describes the preferred method of maintaining secondary heat sink?

A. Maintain SG levels 25-50% NR by manually increasing Steam Driven Aux Feedwater Pump speed OR by manually throttling [HCV-1MS-104], Residual Heat Release Valve.

B. Maintain SG levels 25-50% WR by manually increasing Steam Driven Aux Feedwater Pump speed OR manually throttling [PCV-1MS-101A, B, C], SG Atmospheric Dump Valves.

C. Maintain SG levels greater than 50% NR by operating the Dedicated Auxiliary Feedwater Pump OR by manually throttling [HCV-1MS-104], Residual Heat Release Valve.

D. Maintain SG levels greater than 50% WR by operating the Dedicated Auxiliary Feedwater Pump OR manually throttling [PCV-1MS-101A,B,C], SG Atmospheric Dump Valves.

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. Atmospheric Dump Valves are the alternate method of controlling steam release.
C. Incorrect. Dedicated Aux Feed Pump is only used for situations where inventory is limited.
D. Incorrect. Dedicated Aux Feed Pump is only used for situations where inventory is limited. Atmospheric Dump valves are alternate method of steam removal.

Technical Reference(s): 1OM-56.4.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-56.C.1 Objective 4 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must choose the correct procedure usage based upon given plant conditions.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E12EA2.1	
	Importance Rating		4.0

Ability to determine and interpret the following as they apply to the (Uncontrolled Depressurization of all Steam Generators): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Proposed Question: SRO 78

The Unit has sustained a Main Steam Line Break affecting all 3 SGs.

The crew is currently performing ECA 2.1, Uncontrolled Depressurization Of All Steam Generators, Step 6.

The crew has throttled AFW flow to 50 gpm to each SG to minimize the RCS cooldown.

The following conditions exist:

SG	Level	Pressure
SG "A"	19% WR	320 psig DECREASING
SG "B"	18% WR	310 psig DECREASING
SG "C"	26% WR	380 psig INCREASING

Which one of the following describes the action that should be taken and the reason for the action?

A. Transition to E-2, Faulted Steam Generator Isolation, because there is an intact steam generator available.

B. Transition to FR-H.1, Loss Of Secondary Heat Sink, because there is a RED condition on the Heat Sink Status Tree.

C. Transition to E-3, Steam Generator Tube Rupture, because there is an unexplained increase in steam generator level.

D. Continue with ECA 2.1, Uncontrolled Depressurization Of All Steam Generators, because safety injection termination is not complete.

Proposed Answer: A

Explanation (Optional):

A. Correct. Continuous action of ECA-2.1 requires transition to E-2 when one SG pressure

increases.

B. Incorrect. Operator action reduced feed. Caution prior to Step 1 indicates FR-H.1 would not be entered.

C. Incorrect. One SG is higher than the others, but does not constitute uncontrolled or unexplained increase.

D. Incorrect. SI termination has not been started yet, so transition to E-2 can be made.

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

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3, Objectives 3 and 4 (As available)

Question Source: Bank # X (Vendor Bank)
Modified Bank # (Note changes or attach parent)
New

Question History:

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:

10CFR55.43(b) item 5 because the SRO must evaluate plant conditions and select appropriate procedure.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
		059G2.1.2	
	Importance Rating		4.0

Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation

Proposed Question: SRO 79

Given the following conditions:

- The Unit is at 100% power.
- A discharge of [LW-TK-7A], SG Drains Tank is in progress.
- The following alarms are received:
  - [A4-71], Radiation Monitoring High
  - [A4-72], Radiation Monitoring High-High
- [RM-1LW-104], Liquid Waste Effluent Monitor is the initiating alarm.

The PAB Operator reports that the local High-High alarm for [RM-1LW-104] is lit. All flow control valves and trip valves in the effluent line are open.

Which one of the following actions will be required next?

A. Direct the RO to place the liquid waste discharge to cooling tower blowdown mode control switch [HSS-1LW-3] to OFF.

B. Request Health Physics perform a calibration check or flash the detector with a portable source to determine validity of the alarm.

C. Request Health Physics immediately sample the tank contents to verify the release permit calculations.

D. Direct the PAB Operator to locally open the tank recirculation valve to stop the discharge.

Proposed Answer: A

Explanation (Optional):

A. Correct. SRO should know that this will stop the discharge.
B. Incorrect. HP contacted, but would not immediately check calibration for an alarming

monitor with a failed safety function.

C. Incorrect. Sample taken after the tank is isolated and on recirculation.
D. Incorrect. Tank not placed on recirculation until after isolation of release.

Technical Reference(s): 1OM-43.4.ACQ (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-43.1 Objective 6 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 3 because the SRO is required to know actions for termination of release on high radiation signal.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E06EA2.1	
	Importance Rating		4.2

Ability to determine and interpret the following as they apply to the (Degraded Core Cooling): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Proposed Question: SRO 80

Given the following conditions:

- A LOCA has occurred.
- "A" train SI equipment is operating as required.
- "B" train is deenergized and SI equipment CANNOT be started.
- The Unit Supervisor has announced transition to E-1, Loss Of Reactor Or Secondary Coolant.
- CSF Status Trees indicate the following:
  - Subcriticality Green
  - Core Cooling Orange
  - Heat Sink Yellow
  - Integrity Orange
  - Containment Orange
  - Inventory Yellow

Which one of the following actions shall be taken?

A. Transition to FR-C.1, Response To Inadequate Core Cooling.

B. Transition to FR-C.2, Response To Degraded Core Cooling.

C. Transition to FR-Z.1, Response To High Containment Pressure.

D. Continue in E-1 until transition to ES-1.2, Post-LOCA Cooldown And Depressurization, to restore RCS inventory with available SI equipment.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. FR-C.1 only entered on Core Cooling red path.
B. Correct.
C. Incorrect. Containment is lower priority than Core Cooling, although FR-Z.1 is highest priority Containment procedure.
D. Incorrect. Orange or Red conditions must be immediately addressed in order of priority.

Technical Reference(s): FR-C.2 Entry Conditions (Attach if not previously provided)
CSF Status Trees
1OM-53B.2

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.1 Objective 2.b (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must assess conditions relating to status trees and choose the correct procedure for the event in progress.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		3
		041A2.03	
	Importance Rating		3.1

Ability to (a) predict the impacts of the following malfunctions or operations on the SDS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of IAS.

Proposed Question: SRO 81

Given the following conditions:

- The Unit is at 68% power.
- A loss of station instrument air has occurred.
- The crew is performing the actions of AOP-1.34.1, Loss Of Station Instrument Air.
- The following alarm is received in the Control Room:
  - [A1-56], STEAMLINE STOP VALVE NOT FULLY OPEN

The crew trips the reactor and enters E-0, Reactor Trip Or Safety Injection. The cause is identified and station instrument air pressure has stabilized at 50 psig.

Which one of the following describes how Tavg will be controlled in E-0?

A. Condenser steam dumps in Plant Trip mode

B. Condenser steam dumps in Pressure Control mode

C. Steam generator atmospheric dump valves

D. Steam generator safety valves

Proposed Answer: C

Explanation (Optional):

A. Incorrect. With MSIVs closed or potentially closed, condenser will not be available.
B. Incorrect. Condenser not available.
C. Correct. Either SG Atmospheric dumps or Residual Heat Release Control valve is used in accordance with the AOP.
D. Incorrect. As long as air pressure remains above 30 psig, the ADVs and Heat Release control valve will remain operable.

Technical Reference(s): AOP-1.34.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-53C.1 Objective 5 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must evaluate plant conditions and direct the appropriate procedural guidance for the event in progress.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
		063G2.2.22	
	Importance Rating		4.1

Knowledge of Limiting Conditions for operation and Safety Limits

Proposed Question: SRO 82

Given the following conditions:

- The Unit is at 100% power.
- Maintenance reports that Battery No. 1-1 electrolyte level is overflowing in several cells.

In accordance with the reference provided, what is the maximum time allowed before a Unit shutdown to Mode 3 must begin?

A. 1 Hour

B. 2 Hours

C. 6 Hours

D. 8 Hours

Proposed Answer: B

Explanation (Optional):

A. Incorrect. If Charger is inoperable, surveillance must be performed in one hour.
B. Correct. Category B parameter is outside allowable parameter, TS action 3.8.2.3.a.
C. Incorrect. Time allowed for Shutdown to Mode 3.
D. Incorrect. Total time for attempt to repair, then shutdown to Mode 3.

Technical Reference(s): TS 3.8.2.3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: TS 3.8.2.3 (Attached)

Learning Objective: 1SQS-39.1 Objective 16 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 2 because the SRO must evaluate an operability requirement for TS required equipment and determine the appropriate action requirement.

ELECTRICAL POWER SYSTEMS

DC DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.3 The following DC bus trains shall be energized and OPERABLE:

TRAIN "A" (orange) consisting of 125-volt DC busses No. 1-1 & 1-3, 125-volt DC battery banks 1-1 & 1-3 and chargers 1-1 & 1-3.

TRAIN "B" (purple) consisting of 125-volt D.C. busses No. 1-2 & 1-4, 125-volt DC battery banks 1-2 & 1-4 and chargers 1-2 & 1-4.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.3.2.a.1 within one hour, and at least once per 8 hours thereafter. If any Category A limit in Table 3.8-1 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.3.1 Each DC bus train shall be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and indicated power availability.

4.8.2.3.2 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The parameters in Table 3.8-1 meet the Category A limits, and

2. With the battery on float charge the total battery terminal voltage is greater than or equal to:

a) 127.8 volts for 60 cell batteries 1-1 and 1-2, and

b) 125.67 volts for 59 cell batteries 1-3 and 1-4.

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1. The parameters in Table 3.8-1 meet the Category B limits.

2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and

3. The average electrolyte temperature of every tenth cell of connected cells is above (60°F).

c. At least once per 18 months by verifying that:

1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,

2. The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material.

3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms; and

4. The battery charger will supply at least (100) amperes at 140 volts for at least (4) hours.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the 2-hour design duty cycle when the battery is subjected to a battery service test.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. Once per 60 month interval this performance discharge test may be performed in lieu of the battery service test.

f. At least once per 18 months, during shutdown, performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

TABLE 3.8-1

BATTERY SURVEILLANCE REQUIREMENTS

	CATEGORY A[1]	CATEGORY B[2]	
Parameter	Limits for each designated pilot cell	Limits for each connected call	Allowable[3] value for each connected cell
Electrolyte Level	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts[c]	> 2.07 volts
Specific Gravity[a]	≥ 1.200[b]	≥ 1.195 Average of all connected cells > 1.205	Not more than .020 below the average of all connected cells Average of all connected cells ≥ 1.195[b]

(a) Corrected for electrolyte temperature and level.
(b) Or battery charging current is less than (2) amps when on charge.
(c) Corrected for average electrolyte temperature.
(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

Numbers in parentheses assume a manufacturer's recommended full charge specific gravity of 1.215.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
		014G2.1.27	
	Importance Rating		2.9

Conduct of Operations: Knowledge of system purpose and/or function

Proposed Question: SRO 83

Which one of the following describes how the Rod Position Indication System performs its function?

A. Step Counters indicate actual rod position. ARPI is an estimate of rod position generated from the IPC.

B. ARPI indicates actual rod position as determined by a coil stack on the CRDM housing. Step Counters indicate demanded rod position from the Rod Control System.

C. Step Counters indicate actual rod position as determined by a coil stack on the CRDM housing. ARPI indicates demanded rod position from the Rod Control System.

D. ARPI is an estimate of rod position generated from the IPC. Step Counters indicate demanded position from the Rod Control System.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. The IPC only displays data from Rod Position, does not generate position signals.
B. Correct.
C. Incorrect. Opposite of actual function.
D. Incorrect. ARPI displayed, not generated from IPC.

Technical Reference(s): 1OM-1.1B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-1.3 Objective1 (As available)

Question Source: Bank # Vendor Bank
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
		006A2.10	
	Importance Rating		3.9

Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Low Boron Concentration in SI System

Proposed Question: SRO 85

The Unit is in Mode 1. All systems are in NSA.

Which one of the following conditions requires the EARLIEST action in accordance with Technical Specifications?

A. [CH-TK-1A], Boric Acid Storage Tank boron concentration is 6800 ppm.

B. Refueling Water Storage Tank boron concentration is 2355 ppm.

C. LHSI Pump 'A' INOPERABLE.

D. Charging Pump "A" suction flow path from RWST is inoperable.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. 72 hours.
B. Correct. 1 hour.
C. Incorrect. 72 hours.
D. Incorrect. 72 hours.

Technical Reference(s): TS 3.1.2.8 (Attach if not previously provided)
TS 3.5.2

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-11.1 Objectives 23 and 27 (As available)

Question Source: Bank #

Modified Bank # _____ (Note changes or attach parent)

New X

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____

55.43 X

Comments:

10CFR55.43(b) item 2 because the SRO must know the requirements for entry to TS actions. In this case, one hour or less.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
		010K4.03	
	Importance Rating		4.1

Knowledge of Pressurizer pressure control system design features and/or interlocks that provide for the following: Overpressure control

Proposed Question: SRO 86

Given the following conditions:

- The Unit is at 100% power. All systems are in NSA.
- The following annunciator is received in the Control Room:
  - [A4-9], PRESSURIZER CONTROL PRESS HIGH

The RO determines that [PI-1RC-445], Pressurizer Pressure Transmitter is failing high.

Assuming NO action by the crew, which one of the following describes plant response?

A. One PORV will open.

B. Two PORVs will open.

C. Backup heaters will deenergize and spray valves will open.

D. Backup heaters will deenergize, spray valves will open, and 1 PORV will open.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. PT-445 controls 2 PORVs.
B. Correct.
C. Incorrect. PT-444 controls heaters and spray. If that channel failed, then 1 PORV would also open.
D. Incorrect. PT-444 failure actuations.

Technical Reference(s): 1OM-6.4.ABS (Attach if not previously provided)
1OM-6.1.D

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-6.4 Objective 13 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Previous NRC exam

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

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Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
		034A2.02	
	Importance Rating		3.9

Ability to (a) predict the impacts of the following malfunctions or operations on the FHS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Dropped Cask

Proposed Question: SRO 87

Given the following conditions:

- The Unit is in Mode 1.
- Spent fuel is being loaded into shipping casks in the Spent Fuel Pool area.

Health Physics reports that a cask has been dropped. Immediately following the report, the Fuel Building evacuation alarm sounds.

Radiation Monitors [RM-1VS-103A and B], Fuel Building Ventilation Exhaust are in alarm.

Based on the above conditions, which one of the following actions is IMMEDIATELY required by AOP-1.49.1, Irradiated Fuel Damage?

A. Initiate Site Evacuation.

B. Manually initiate Control Room isolation.

C. Reset CREBAPS and manually align Control Room ventilation.

D. Align Leak Collection Exhaust flow to the Main Filter Banks using the Containment Purge System.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Evaluation will be made in accordance with EPPs on whether to evacuate the site. AOP-1.49.1 ensures the Fuel Building is evacuated.
B. Correct.
C. Incorrect. Action performed in 1 hour.
D. Incorrect. Action for fuel handling accident in Containment.

Technical Reference(s): AOP-1.49.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1OM-53C.1 Objective 5 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) items 4, 5, 7 because the SRO must determine the event in progress and choose the appropriate procedure action. Additionally, this action is related to minimizing exposure to radiation during accident conditions in the course of fuel movement.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		3
		078A2.01	
	Importance Rating		2.9

Ability to (a) predict the impacts of the following malfunctions or operations on the IAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Air dryer and filter malfunctions.

Proposed Question: SRO 88

Given the following conditions:

- The Unit is at 100% power. All systems are in NSA.
- [PI-1SA-101], Station Air Main Header Pressure has been slowly decreasing and is indicating 98 psig.
- The crew enters AOP-1.34.1, Loss Of Station Instrument Air.
- Both station air compressors are running. No reports of air leakage have been received.

Which one of the following actions will be performed next in accordance with AOP-1.34.1, Loss Of Station Instrument Air?

A. Bypass the instrument air dryers.

B. Dispatch an operator to start the diesel air compressor.

C. Close [TV-1SA-105], Station Air Compressor Header Isolation Valve.

D. Trip the reactor and enter E-0, Reactor Trip Or Safety Injection.

Proposed Answer: A

Explanation (Optional):

A. Correct. SACs running, next action to bypass dryers.
B. Incorrect. Not performed if SACs already running.
C. Incorrect. Not performed unless IA pressure goes below 95 psig.
D. Incorrect. Not performed unless MSIVs drift closed.

Technical Reference(s): AOP-1.34.1 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53C.1 Objective 5 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must choose appropriate procedural action based upon evaluation of given conditions.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		2.3.10	
	Importance Rating		3.3

Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure

Proposed Question: SRO 89

Given the following conditions:

- You are required to make an entry to a Locked High Radiation Area.
- Your year-to-date exposure is 2.6 Rem Total Effective Dose Equivalent (TEDE).
- The job is planned to take 20 minutes to complete with 5 minutes transit time each way.
- Transit path radiation levels are 400 mr/hr.
- Work area radiation levels are 1200 mr/hr.

Which one of the following conditions describes your eligibility to perform this task?

A. You may perform this task provided you are signed onto a High Radiation Area RWP.

B. Special approval is required for this task because you will exceed the BVPS TEDE limit.

C. You may only perform this task if you meet the requirements for a Planned Special Exposure (PSE).

D. You cannot perform the task because your current year to date exposure is already within 80% of the BVPS administrative TEDE limit.

Proposed Answer: A

Explanation (Optional):

A. Correct. 2.6 Rem + (10min. X 400 mr/hr) + (20 min X 1200 mr/hr) = 3066 mr total for year.
B. Incorrect. TEDE will not be exceeded. No additional levels of approval necessary.
C. Incorrect. PSEs for Emergencies with greater dose.
D. Incorrect. 80% not exceeded.

Technical Reference(s): 1/2-ADM-1601 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # 1LOT4RO/SRO #94 (Note changes or attach parent)
New _____

Question History: 1LOT4 RO/SRO #94

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 4 because the SRO must determine whether dose will be exceeded in a high radiation area.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.4.1	
	Importance Rating		4.6

Knowledge of EOP entry conditions and immediate action steps.

Proposed Question: SRO 90

Given the following conditions:

- The Unit was at 100% power.
- A reactor trip coincident with a loss of offsite power occurs.
- BOTH emergency diesel generators fail to start.
- Reactor power indicates 56% and STABLE.
- SG safety valves are open.

Which one of the following describes the appropriate procedure usage for this event?

A. Enter E-0, Reactor Trip Or Safety Injection. If reactor cannot be tripped, transition to FR-S.1, Response To Nuclear Power Generation/ATWS to initiate emergency boration.

B. Enter ECA-0.0, Loss Of All AC Power. If reactor trip cannot be verified, transition to FR-S.1 to initiate emergency boration.

C. Enter ECA-0.0. Attempt to trip the reactor. If reactor trip cannot be verified, continue in the EOP. Transition to FR-S.1 when directed to monitor CSF Status Trees upon restoration of power.

D. Enter E-0. Attempt to trip the reactor. If reactor cannot be tripped, initiate Emergency Boration to shut down the reactor. Enter FR-S.1 when directed to monitor CSF Status Trees upon restoration of power.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. No power available to enter FR-S.1.
B. Incorrect. No transition to FR-S.1 at step 0 of ECA-0.0.
C. Correct.
D. Incorrect. No emergency boration in E-0.

Technical Reference(s): 1/2 OM-53.B.2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.1 Objective 1 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO must assess the current conditions and evaluate appropriate procedure use.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.4.36	
	Importance Rating		2.8

Knowledge of chemistry / health physics tasks during emergency operations.

Proposed Question: SRO 91

An event has occurred resulting in a Site Area Emergency declaration.

Health Physics assistance is required for a task being performed in the Auxiliary Building.

Which one of the following Emergency Response Facilities will supply personnel for the task support?

A. Control Room

B. Technical Support Center

C. Operations Support Center

D. Emergency Operations Facility

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Control Room will not provide plant support for SAE. Safe operation of facility.
B. Incorrect. TSC provides technical guidance.
C. Correct. Field personnel from OSC.
D. Incorrect. EOF contains mgmt. decision-makers, resource allocation, and HP mgmt.

Technical Reference(s): EPP/IP-1.5 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.1.26	
	Importance Rating		2.6

Knowledge of non-nuclear safety procedures (e.g., rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen.

Proposed Question: SRO 92

An oil spill has occurred at the site.

Approximately 10 gallons of diesel fuel oil was spilled in the containment area around the Diesel Fuel Oil Storage Tank.

Which one of the following correctly describes the personnel/agencies that must be notified in accordance with AOP-1/2.75.6?

A. BVPS Environmental Services

B. Nuclear Regulatory Commission

C. BVPS Environmental Services and Pennsylvania Department of Environmental Protection

D. Operations Manager and Plant General Manager

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. NRC not informed of environmental spills < 25 gallons.
C. Incorrect. PA Dept. only required for larger reportable spills.
D. Incorrect. Same as B above.

Technical Reference(s): AOP 1/2.75.6 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53C.1 Objective 5 (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.3.5	
	Importance Rating		2.5

Knowledge of use and function of personnel monitoring equipment``

Proposed Question: SRO 93

Which one of the following describes the alarm function of a RADOS alarming dosimeter?

A. Intermittent beep for Dose Rate alarm. Continuous beep for Dose alarm.

B. Continuous beep for Dose Rate alarm. Intermittent beep for Dose alarm.

C. Intermittent beep for Dose Rate alarm. Stops beeping when integrated dose limit is exceeded.

D. Continuous beep for Dose Rate alarm. Stops beeping when integrated dose limit is exceeded.

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. Opposite of actual operation.
C. Incorrect. Stops beeping when rate no longer exceeded.
D. Incorrect. Stops beeping when rate no longer exceeded and also not continuous.

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

Proposed References to be provided to applicants during examination: NONE

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.1.12	
	Importance Rating		4.0

Ability to apply Technical Specifications for a system

Proposed Question: SRO 94

Given the following conditions:

- The Unit is operating at 100% power.
- No. 1 EDG has been OOS for 24 hours and is expected to return to service in 24 hours.
- It is discovered that there is no documentation of the last monthly surveillance on No. 2 EDG. The most recent documentation is 47 days old.

Which one of the following actions, if any, is required?

A. Perform the missing surveillance to verify the operability of No. 2 EDG within 1 hour or take additional action in accordance with TS 3.8.2.1.

B. Perform the missing surveillance to verify the operability of No. 2 EDG within 24 hours or take additional action in accordance with TS 3.8.1.1.

C. Declare No. 2 EDG inoperable and immediately take action in accordance with TS 3.0.3.

D. No action required. Because the EDGs are on a staggered test basis, No. 2 EDG is still within the required time interval for operability determination.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. 24 hours is allowed.
B. Correct.
C. Incorrect. For missed surveillances, there is an allowable time of 24 hours or the normal surveillance interval, whichever is less.
D. Incorrect. Staggered test basis determines subintervals. Each EDG would be tested every 31 days, just on different weeks or cycles.

Technical Reference(s): TS 4.0.3 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-TS.3 Objective 5.g (As available)

Question Source: Bank # Vendor Bank
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 2 because the SRO must understand TS 4.0.3 and apply the operability requirement to the equipment affected.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.2.11	
	Importance Rating		3.4

Knowledge of the process for controlling Temporary Changes

Proposed Question: SRO 95

Given the following:

- Planned maintenance on a system requires a portion of the system to be taken out of service for several days.
- A fire hose will be installed to bypass the affected portion of the system.
- The changes to, and operation of, the system will be considered extensive.
- The changes to the system for this maintenance are one-time only.

Which one of the following documents will be generated for this evolution?

A. Temporary Operating Procedure

B. Significant Change Procedure Revision

C. Limited Use Procedure Revision

D. Non-Intent Temporary Change Notice

Proposed Answer: A

Explanation (Optional):

A. Correct.
B. Incorrect. Significant change is part of procedure revision process.
C. Incorrect. Part of procedure revision process.
D. Incorrect. Provided for non-permanent changes required prior to next procedure use.

Technical Reference(s): NOP-SS-3001 (Attach if not previously provided)
1/2 ADM-0101

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-48.1 Objective 12 (As available)

Question Source: Bank # _____
Modified Bank # X (Note changes or attach parent)
New _____

Question History: 2LOT3 NRC Question 95

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 3 because the SRO must know the procedures required to change operation of the facility as intended.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
		G2.1.8	
	Importance Rating		3.6

Ability to coordinate personnel activities outside the Control Room.

Proposed Question: SRO 96

Given the following conditions:

- You are the Shift Manager.
- The Control Room is being evacuated due to a fire.
- Control cannot be established from the Emergency Shutdown Panel.
- 1OM-56C.4.B, Alternate Safe Shutdown Outside Control Room is being implemented, using Train "A" equipment.

Which one of the following describes the method you will use to direct shutdown activities once the Control Room is evacuated?

A. Proceed to the Fire Brigade Room, turn over Emergency Director responsibility to the STA, initiate contact with Operations personnel by radio, and proceed to the Backup Indicating Panel to monitor plant parameters.

B. Proceed to the Technical Support Center and direct Operations activities using the Appendix R phone.

C. Perform the appropriate procedure to align plant equipment and proceed to the Backup Indicating Panel to monitor plant parameters and direct action using the radio or Appendix R phone.

D. Proceed to the Operations Support Center until the Emergency Organization is activated, and then report to the Fire Brigade Room to direct activities using the Appendix R phone.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Do not turn over E-Plan to STA.
B. Incorrect. TSC will not be manned by the US. E-Plan activities in TSC will be provided by support organization when ERFs are staffed.

C. Correct
D. Incorrect. Do not go to OSC. Do not direct action from Fire Brigade Room. Only go to Fire Brigade room to get procedures and commence action.

Technical Reference(s): 1OM-56.C.4.B (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-56.C.1 Objective 4 (As available)

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

Question History:

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

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 1 because the SRO must understand actions related to Appendix R when normal alternate shutdown capability is unavailable.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	009EK3.13	
	Importance Rating		3.7

Knowledge of the reasons for the following responses as they apply to the small break LOCA: Stopping the affected RCP.

Proposed Question: SRO 97

The reactor is tripped. Safety Injection is actuated. All equipment is operating as designed.

Which one of the following describes the reason that RCPs are tripped on RCS to Highest Steam Generator Delta-P?

A. Operation of RCPs with Delta-P less than minimum may mask subsequent SGTRs and give false indication of adequate RCS inventory.

B. Low RCS to SG Delta-P is an indication that a LOCA is in progress for which continued operation will result in damage to the RCPs.

C. RCP operation during loss of RCS pressure caused by a SBLOCA may result in core uncovery if the RCPs were tripped later in the event.

D. Once RCS pressure is below SG pressure, ECCS flow provides more efficient RCS heat removal. Operation of the RCPs may impede the RCS inventory recovery provided by ECCS.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Two phase flow provided by RCPs may give inaccurate RCS inventory indication but lower RCS pressure would be beneficial to a SG with a tube failure. RCPs not tripped for those reasons.

B. Incorrect. Damage may result on low RCS pressure and loss of subcooling, but it is not the reason for tripping RCPs.

C. Correct.

D. Incorrect. Forced Circulation is always preferable for RCS heat removal.

Technical Reference(s): 1OM-53B.5.GI-6 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.2 Objective 1 (As available)

Question Source: Bank # _____
Modified Bank # X(Vendor Bank) (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 X
55.43 _____

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
		025AA2.06	
	Importance Rating		3.4

Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Existence of proper RHR overpressure protection.

Proposed Question: SRO 98

Given the following conditions:

- The Unit is in Mode 5.
- A loss of RHR has occurred.
- The crew has been unable to maintain an RHR pump operating and is preparing to repressurize the RCS in preparation for providing heat removal with "A" SG.
- The crew is directed to check OPPS in service prior to pressurizing the RCS.
- RCS pressure is 290 psig and rising slowly.
- RCS temperature is 195°F and rising slowly.

Which one of the following satisfies the Technical Specification requirement for checking OPPS in service under these conditions?

A. One PORV armed for OPPS. PORV should be closed.

B. One PORV armed for OPPS. PORV should be open.

C. Two PORVs armed for OPPS. PORVs should be closed.

D. Two PORVs armed for OPPS. PORVs should be open.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. Two PORVs required by TS.
B. Incorrect. Two PORVs required and should be closed.
C. Correct.
D. Incorrect. PORVs should be closed until approximately 420 - 430 psig.

Technical Reference(s): TS 3.4.9.3 (Attach if not previously provided)

AOP-1.10.1 Step 17

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 1SQS-6.4 Objective 15 (As available)

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

Question History:

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis Comp

10 CFR Part 55 Content: 55.41
55.43 X

Comments:
10CFR55.43(b) item 2 because the SRO must know the TS requirement for OPPS operability.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
		E16EK2.2	
	Importance Rating		3.0

Knowledge of the interrelations between the (High Containment Radiation) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Proposed Question: SRO 99

Given the following conditions:

- A LOCA has occurred.
- Safety Injection was lost and containment radiation increased to 3E+5 R/Hr.
- Safety Injection has been reestablished, and containment radiation is now 2E+3 R/Hr and trending DOWN.

Which one of the following describes the correct usage of Adverse Containment parameter values for this event?

A. Not required during any part of this transient.

B. Required when the dose rate limit was exceeded, but are no longer required when the dose rate is below the limit.

C. Required as soon as the dose rate limit was exceeded, and remain in effect for the duration of the event because the total integrated dose is unknown.

D. Required as soon as the dose rate limit was exceeded, and remain in effect for the duration of the event because since the dose rate limit was exceeded, the total integrated dose was also exceeded.

Proposed Answer: C

Explanation (Optional):

A. Incorrect. The limit is 1E+5.
B. Incorrect. If dose is exceeded, parameters remain in adverse for duration.
C. Correct. No way of determining accumulated, or integrated, dose.
D. Incorrect. No way of determining integrated dose.

Technical Reference(s): 1OM-53.5B.GI-2 (Attach if not previously provided)

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.2 Objective 15 (As available)

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

Question History: Mod from 1LOT4 2001 NRC Exam (Attached)

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

10 CFR Part 55 Content: 55.41 X
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
		E03G2.4.31	
	Importance Rating		3.4

Emergency Procedures / Plan: Knowledge of annunciators alarms and indications, and use of the response instructions.

Proposed Question: SRO 100

Given the following conditions:

- A Small Break LOCA has occurred.
- The crew is performing the actions of ES-1.2, Post LOCA Cooldown And Depressurization.
- Both LHSI pumps have been stopped.
- One HHSI pump has been stopped.
- Normal charging is aligned.
- The crew is depressurizing the RCS.
- When the depressurization is stopped, the following conditions exist:
  - RCS subcooling is 40°F and trending DOWN.
  - Pressurizer level is 18% and trending DOWN.

Based on these indications, what actions should be taken?

A. Isolate letdown. Check to ensure Pressurizer level stabilizes above 18%.

B. Manually start SI pumps as necessary to regain subcooling.

C. Reinitiate SI and verify all safeguards equipment has actuated.

D. Increase RCS pressure using pressurizer heaters to regain subcooling.

Proposed Answer: B

Explanation (Optional):

A. Incorrect. Letdown is already out of service in this event.

B. Correct. Unexpected Condition summary directs the action.

C. Incorrect. Reinitiation of SI may result in a higher pressure than necessary for the plant conditions, and RHR will be running again at shutoff head.

D. Incorrect. Although pressurizer heaters are energized to establish a bubble in the pressurizer, they are not used to repressurize the RCS on loss of subcooling.

Technical Reference(s): ES-1.2 Unexpected Condition (Attach if not previously provided)

summary

Proposed References to be provided to applicants during examination: NONE

Learning Objective: 3SQS-53.3 Objective 6 (As available)

Question Source: Bank # X(Vendor Bank)
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History:

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

10 CFR Part 55 Content: 55.41 _____
55.43 X

Comments:
10CFR55.43(b) item 5 because the SRO is required to evaluate plant conditions and determine the appropriate procedural direction.