

NRC Site-Specific Written Examination
Callaway Plant
Senior Reactor Operator
Reactor Operator

Question #1

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>003 A3.04</u>	_____
Importance Rating	<u>3.6</u>	_____

Ability to monitor automatic operation of the RCPS

Proposed Question: Common 1

Given the following conditions:

- The plant is in Hot Standby.
- RCS temperature is 540°F.
- RCS cooldown is in progress.
- All RCPs are running.

Which ONE (1) of the following describes the response of indicated RCS flow as the cooldown continues?

Indicated flow...

- A. INCREASES as coolant density INCREASES.
- B. DECREASES as coolant density INCREASES.
- C. INCREASES as coolant density DECREASES.
- D. DECREASES as coolant density DECREASES.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Indicated flow will increase as density increases (DP increases).
- C. Incorrect. Density will increase as RCS cooldown continues.
- D. Incorrect. Opposite of actual effect on both parameters.

Technical Reference(s) Steam Tables (Attach if not previously provided)
GFES – Sensors/Detectors

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Proposed references to be provided to applicants during examination: None

Learning Objective: Reactor Coolant System B.10 (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 14

Comments:
WTSI 18769, IP3 2003

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Question #2

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>004 K5.26</u>	_____
Importance Rating	<u>3.1</u>	_____

Knowledge of the operational implications of the following concepts as they apply to the CVCS: Relationship between VCT pressure and NPSH for charging pumps

Proposed Question: Common 2

Following an instrument failure, VCT level and pressure are being reduced to normal values.

Which ONE (1) of the following describes a precaution in OTN-BG-00004, "VCT Atmosphere Control," associated with the pressure reduction, and the reason for the precaution?

- A. Reduce pressure slowly to prevent gasses from coming out of solution in the Charging Pump suction.
- B. Reduce pressure slowly to 10 psig to ensure adequate backpressure on the RCP #1 seal.
- C. Do not allow VCT pressure to go below 22 psig to prevent gasses from coming out of solution in the Charging Pump suction.
- D. Do not allow VCT pressure to go below 22 psig to ensure adequate backpressure on the RCP #2 seal.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Minimum pressure of 15 psig ensures flow to #2 seal from backpressure provided by #1 seal.
- C. Incorrect. 22% is minimum level. Minimum pressure for alarm is 13 psig. For seals is 15 psig.
- D. Incorrect. 22% is minimum level. Minimum pressure for alarm is 13 psig. For seals is 15 psig.

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Question #3 Changed on Post Exam Comments (see Exam Report 2007/301 for details)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>005 K6.03</u>	<u> </u>
	Importance Rating	<u>2.5</u>	<u> </u>

Knowledge of the effect of a loss or malfunction on the following will have on the RHRs: RHR heat exchanger

Proposed Question: Common 3

Given the following:

- The plant is in Mode 4.
- RHR Train "A" is in service.
- RHR Heat Exchanger Bypass Valve EJ FCV-618 is set to maintain 3400 GPM.
- RHR Heat Exchanger outlet valve EJ HCV-606 demand position set at 30%.
- The Instrument Air supply line to RHR Heat Exchanger Bypass Valve EJ FCV-618 becomes severed and is completely detached.
- No other air operated valves are impacted by the failure.

Which ONE (1) of the following describes the RHR system parameter changes from the initial steady state conditions?

	<u>RHR HX Outlet Temp.</u>	<u>Total RHR flow</u>
A.	Higher	Higher
B.	Higher	Lower
C.	Lower	Lower
D.	Lower	Higher

Proposed Answer: C and B (since there are two Outlet Temp. indications and the

Explanation (Optional): answer is affected by which one is used)

C: Correct. Total RHR flow is controlled by FCV-618, RHR HX Bypass, so it will lower. FCV-618 fails closed, so there is less bypass flow mixing with more HX flow, resulting in a lower temperature on the HX outlet.

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B: Incorrect. Total RHR flow is controlled by FCV-618 and would lower, forcing more water through the RHR HX for cooling.

A: Incorrect. FCV 618 failing closed will result in full cooling through the RHR HX and the HX outlet temperature will lower along with the total RHR flow lowering. Plausible because the applicant may confuse valves for total flow versus HX flow

D: Incorrect. Temperature effect is correct and plausible because the applicant may confuse valves for total flow versus HX flow

Technical Reference(s) M-22EJ01, P&ID for RHR System (Attach if not previously provided)
Systems -RHR Lesson

Proposed references to be provided to applicants during examination: None

Learning Objective: Systems –RHR – Obj. D (As available)

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

Question History: Last NRC Exam

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

10 CFR Part 55 Content: 55.41 5

Comments:
 WTSI 53164 North Anna

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Question #4

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>006 A2.12</u>	_____
	Importance Rating	<u>4.5</u>	_____

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: Conditions requiring actuation of ECCS

Proposed Question: Common 4

Given the following conditions:

- A reactor trip has occurred.
- The crew has transitioned to ES-0.1, Reactor Trip Response.

The following conditions develop:

- RCS pressure is 1950 psig and lowering slowly.
- Charging Pump “A” is RUNNING.
- Charging Pump “B” is in STANDBY.
- Charging flow is offscale HIGH.
- Letdown is isolated.
- RCS temperature is 542°F and slowly lowering.
- PZR level is 4% and lowering.

Which ONE (1) of the following actions is required?

- A. Initiate SI and continue in ES-0.1.
- B. Initiate SI and return to E-0, Reactor Trip Or Safety Injection.
- C. Start CCPs as required to maintain PZR level and continue in ES-0.1.
- D. Start CCPs as required to maintain PZR level and return to E-0.

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Question #5

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>007 A4.10</u>	_____
	Importance Rating	<u>3.6</u>	_____

Ability to manually operate and/or monitor in the control room: Recognition of leaking PORV/code safety
 Proposed Question: Common 5

While in Mode 3, the following conditions exist in the PRT:

- LEVEL at 78% and INCREASING SLOWLY
- PRESSURE at 18 PSIG and INCREASING SLOWLY
- TEMPERATURE at 165 DEG F and INCREASING

Which ONE (1) of the below is the cause of the conditions above?

- A. Seat leakage from Pressurizer Safety (BB8010C)
- B. Seat leakage from RHR discharge relief (EJ8856A)
- C. CLOSING RCP No. 1 Seal Leakoff Isolation (BBHV8141B)
- D. OPENING PRT Reactor Makeup Water Supply (BBHV8045)

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Relieves to RHUT
- C. Incorrect. Relief Valve is downstream of isolation 8141B
- D. Incorrect. Temperature not high enough

Technical Reference(s) T61.0110 6, LP-09, RCS (Attach if not previously provided)
M-22BB02

Proposed references to be provided to applicants during examination: _____ None

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Learning Objective: Systems LP09, Obj. E (As available)

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

Question History: Last NRC Exam 2004

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

10 CFR Part 55 Content: 55.41 14

Comments:

2004 Callaway NRC – Values Changed, Mode changed

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Question #6

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>008 A1.04</u>	
	Importance Rating	<u>3.1</u>	_____

Ability to predict and/or monitor changes in parameters to prevent exceeding design limits) associated with operating the CCWS controls including: Surge tank level

Proposed Question: Common 6

Given the following:

- The plant is at 100% power.
- “B” CCW train is aligned to the Service Loop.
- “B” CCW Surge Tank level is 62% and rising.

Which ONE (1) of the following actions should be taken?

- A. Isolate Radwaste CCW Supply and Return Valves.
- B. Swap CCW Heat Exchangers to supply the Service Loop from “A” Train.
- C. Isolate CCW to the SI and RHR Pump oil coolers.
- D. Transfer Letdown from the Normal to the Excess Letdown flowpath.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. All systems in Radwaste at lower pressure and would result in outleakage from CCW
- B. Incorrect. Leak would only transfer to the other train
- C. Incorrect. Pressure would result in outleakage from CCW
- D. Correct

Technical Reference(s) OTO-BB-00003 _____ (Attach if not previously provided)

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OTO-EG-00001

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7/10

Comments:
WTSI 47508 Point Beach 2003

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Question #7

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>010 K1.08</u>	_____
	Importance Rating	<u>3.2</u>	_____

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

Proposed Question: Common 7

Given the following:

- The plant is at 55% power.
- BB LT-459 is the controlling Pressurizer Level Transmitter.
- BB LT-459 fails high instantaneously.

Assuming NO action by the crew, which ONE (1) of the following describes the initial observable effect on CVCS and Pressurizer Heaters?

- A. Charging flow lowers; Pressurizer Backup Heaters energize.
- B. Charging flow lowers; Pressurizer Backup Heaters de-energize.
- C. Letdown isolates; Pressurizer Backup Heaters de-energize.
- D. Letdown isolates; Pressurizer Backup Heaters energize.

Proposed Answer: A

Explanation (Optional):

- A. Correct. 5% level deviation HIGH will cause backup heaters to energize
- B. Incorrect. Charging lowers but heaters will energize.
- C. Incorrect. Letdown will isolate later when backup channel is low if no action is taken. This would happen for a low failure of controlling channel
- D. Incorrect. Letdown will isolate later when backup channel is low if no action is taken.

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Technical Reference(s) OTO BG-00001 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7 _____

Comments:

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Question #8

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>012 K6.03</u>	_____
	Importance Rating	<u>3.1</u>	_____

Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Trip logic circuits
 Proposed Question: Common 8

The plant is at 100% power.

Pressurizer Pressure Protection Channel PT-455 fails and is properly removed from service.

Which ONE (1) of the following identifies the Reactor Protection System and ESF actuation logic required, from the remaining in-service channels, to initiate a reactor trip and safety injection on low pressurizer pressure?

- | <u>Reactor Trip</u> | <u>Safety Injection</u> |
|---------------------|-------------------------|
| A. 1/2 | 1/2 |
| B. 1/2 | 1/3 |
| C. 1/3 | 1/3 |
| D. 2/3 | 2/3 |

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. PZR level is normally 2 of 3 logic but pressure is a 2 of 4
- B. Incorrect. PZR level is normally 2 of 3 logic but pressure is a 2 of 4
- C. Correct.
- D. Incorrect. Bistables are tripped when a channel is removed from service. Therefore, 1 channel is already tripped and 1 more is required for the function

Technical Reference(s) RPS LP (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:

WTSI 57250 Various items, VC Summer 2006 most recent, different logic

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Question #9

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>012 K3.04</u>	_____
	Importance Rating	<u>3.8</u>	_____

Knowledge of the effect that a loss or malfunction of the RPS will have on the following: ESFAS
 Proposed Question: Common 9

Given the following:

- The plant is at 100% power.
- Containment Pressure Channel I has failed HIGH.
- NO action has been taken by the crew.
- Subsequently, Instrument Bus NN03 is deenergized due to a fault.

Which ONE (1) of the following describes the effect on Safeguards Actuation signals?

- A. NO safeguards signals will actuate.
- B. ONLY Safety Injection will actuate.
- C. ONLY Safety Injection and Main Steam Line Isolation will actuate.
- D. Safety Injection, Main Steam Line Isolation, and Containment Spray will actuate.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. 2 of 4 on SI, 2 of 3 on MSLI
- B. Incorrect. MSLI will also actuate due to High-2
- C. Correct.
- D. Incorrect. Spray will not actuate because the bistable is energize to actuate. Losing an instrument bus will not cause the bistable to energize

Technical Reference(s) RPS LP (Attach if not previously

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_____ 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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:

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Question #10

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>013 A1.04</u>	_____
Importance Rating	<u>3.4</u>	_____

Ability to predict and/or monitor changes in parameters (to Prevent exceeding design limits) associated with operating the ESFAS controls including: SG level

Proposed Question: Common 10

Given the following:

- The plant is at 44% power.
- A Feedwater Control malfunction has resulted in the following:
 - 'A' SG level 35% and lowering slowly
 - 'B' SG level 38% and lowering slowly
 - 'C' SG level 92% and rising slowly
 - 'D' SG level 36% and lowering slowly
- All systems operate as designed.

Which ONE (1) of the following describes the actuations that have taken place?

- A. Turbine Trip; NO Reactor trip; Main Feedwater Isolation Valves closed.
- B. Turbine Trip; NO Reactor trip; Main Feedwater Pumps running.
- C. Reactor Trip due to Turbine trip; Main Feed Isolation Valves closed.
- D. Turbine Trip due to Reactor Trip; Auxiliary Feedwater Pumps running.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Main FW pumps would not be running due to the P-14
- C. Incorrect. Power is below P-9

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D. Incorrect. P-14 causes a turbine trip

Technical Reference(s) TS 3.3.2 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:

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Question #11

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>013 K4.06</u>	_____
	Importance Rating	<u>4.0</u>	_____

Knowledge of ESFAS design feature(s) and/or interlock(s) which provide for the following Recirculation actuation system reset

Proposed Question: Common 11

Given the following:

- A LOCA has occurred.
- Due to equipment failures, the crew is performing actions contained in ECA-1.1, Loss of Emergency Coolant Recirculation.
- The RO places the SI (RWST) Switchover Signal switches in the RESET position.

Which ONE (1) of the following describes the function provided by placing the switches in RESET?

- A. Allows Containment Spray Pump discharge valves to be closed when no longer required.
- B. Allows SI and RHR pumps to be started and stopped as required during the Cold Leg Recirculation phase of the event.
- C. Restores automatic control of the RHR Pump recirc valves.
- D. Prevents inadvertent loss of RWST inventory due to automatic switchover.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Resetting Containment Spray provides this function
- B. Incorrect. Pump start and stop is controlled by SI reset
- C. Incorrect. Resetting SI will allow restoration of RHR recirc

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D. Correct. Valves may be closed to ensure that RWST contents do not continue to flow to containment

Technical Reference(s) ECA-1.1 BD (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:

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Question #12

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>022 A3.01</u>	
Importance Rating	<u>4.1</u>	_____

Ability to monitor automatic operation of the CCS, including: Initiation of safeguards mode of operation
 Proposed Question: Common 12

Given the following:

- A LOCA has occurred.
- Safety Injection was manually actuated.

Which ONE (1) of the following describes the cooling water alignment to the Containment Coolers?

- A. Service Water aligned at approximately 2200 GPM per cooler.
- B. Service Water aligned at approximately 3500 GPM per cooler.
- C. ESW aligned at approximately 2200 GPM per cooler.
- D. ESW aligned at approximately 3500 GPM per cooler.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Service Water provides normal cooling at this rate
- B. Incorrect. Service Water provides normal cooling, but this rate is the safeguards flow rate
- C. Incorrect. Correct supply, as coolers shift to ESW on SIS. Incorrect rate
- D. Correct.

Technical Reference(s) Cmt Vent GN/GS/GT _____ (Attach if not previously provided)

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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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 4

Comments:

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Question #13

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>022 K4.02</u>	_____
	Importance Rating	<u>3.1</u>	_____

Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Correlation of fan speed and flowpath changes with containment pressure

Proposed Question: Common 13

Given the following:

- The plant was at 100% power, all systems in normal alignments.
- Three Containment Cooling Units were operating in FAST Speed.
- One Containment Cooling Unit was in NORMAL – AFTER STOP with the fan OFF.
- A reactor trip occurred.

Current conditions have existed for approximately 1 minute:

- RCS pressure is 1900 psig and lowering slowly.
- Containment pressure is 4.5 psig and rising slowly.

Which ONE (1) of the following describes the Containment Cooler alignment under these conditions?

- A. Three fans in SLOW speed; One fan OFF.
- B. Three fans in FAST speed; One fan OFF.
- C. Four fans in SLOW speed.
- D. Four fans in FAST speed.

Proposed Answer: C

Explanation (Optional):

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- A. Incorrect. The fan in NORMAL will auto start on the SI
- B. Incorrect. This alignment would remain if SI had not occurred. Ctmt pressure is above SI setpoint.
- C. Correct.
- D. Incorrect. The fourth fan will start, but all 4 fans shift to slow at step 7 on the sequencer.

Technical Reference(s) Ctmt Vent LP (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 4

Comments:
Have similar in Bank but at memory level

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Question #14

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>026 K4.01</u>	_____
	Importance Rating	<u>4.2</u>	_____

Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following: Source of water for CSS, including recirculation phase after a LOCA

Proposed Question: Common 14

Given the following:

- A LOCA has occurred.
- RCS pressure is 600 psig.
- Containment Pressure is 31 psig.

Which ONE (1) of the following describes the operation of Containment Spray for this event?

- A. Containment Spray suction valves to the Containment Sump automatically open at 36% RWST level.
- B. Containment Spray suction valves to the Containment Sump must be manually opened when RWST level reaches 36%.
- C. Containment Spray suction valves to the Containment Sump automatically open at 12% RWST level.
- D. Containment Spray suction valves to the Containment Sump must be manually opened when RWST level reaches 12%.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Auto ops of ECCS suction from sump at this level
- B. Incorrect. Manual ops of spray, but not enabled at 30% RWST
- C. Incorrect. No auto open, only permissive
- D. Correct. LO-LO-2, enables valves to be manually opened

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Technical Reference(s) ES-1.3 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:

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Question #15

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>039 K5.01</u>	_____
Importance Rating	<u>2.9</u>	_____

Knowledge of the operational implications of the following concepts s the apply to the MRSS: Definition and causes of steam/water hammer

Proposed Question: Common 15

Given the following:

- A plant heatup is in progress in accordance with OTG-ZZ-00001, Plant Heatup From Cold Shutdown to Hot Standby.

Which ONE of the following actions may be required, and the reason for the action, in accordance with OTG-ZZ-00001?

- A. Isolate main steam drains when RCS temperature is above 300 degrees F to prevent water hammer in the Main Steam lines.
- B. Periodically cycle low point steam drains during the heatup to prevent water hammer in the Main Steam Lines.
- C. Maintain main steam drains open when RCS temperature is above 300 degrees F to expedite RCS heatup.
- D. Maintain steam trap bypass valves partially open during the heatup to expedite RCS heatup

Proposed Answer: B

Explanation (Optional):

B is correct.

A is incorrect because water buildup may water hammer if valves are closed

C is incorrect because maintaining valves open will delay the heatup

D is incorrect because maintaining valves partially open will delay the heatup

Technical Reference(s) OTG-ZZ-00001, step 5.7.5 (Attach if not previously

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_____ provided)
CAR #200604255

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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 4

Comments:

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Question #16 **Changed during Exam Administration**

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>059 A2.11</u>	<u> </u>
	Importance Rating	<u>3.0</u>	<u> </u>

Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of feedwater control system

Proposed Question: Common 16

The following plant conditions exist:

- Reactor Power is 40%.
- ACPT0506 is the selected Impulse Pressure Channel.
- All control systems are in their normal lineup.

Which ONE (1) of the following failures would cause an INITIAL INCREASE in feedwater flow to all S/Gs and what action would mitigate the failure?

- A. Main Steam Header Pressure Channel, **ABPT0507** 8, fails LOW. Take manual control of Main Feedwater Regulating valves.
- B. Main Feed Header Pressure Channel, ABPT0508, fails LOW. Take manual control of Main Feedwater pump speed.
- C. Turbine Impulse Pressure Channel, ACPT0506, fails LOW. Take manual control of Main Feedwater pump speed.
- D. Turbine Impulse Pressure Channel, ACPT0506, fails LOW. Take manual control of Main Feedwater Regulating valves.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Feed flow would be reduced if this failure occurred
- B. Correct.
- C. Incorrect. Input to feed control is not input to Main Feed Pump speed
- D. Incorrect. Input to feed control is not input to Main Feed Pump speed

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Technical Reference(s) OTO AE-00001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: T61.0110 6, LP-23 (As available)
Systems

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

 New _____

Question History: Last NRC Exam

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

10 CFR Part 55 Content: 55.41 7

Comments:

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Question #17

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>059 K1.02</u>	_____
Importance Rating	<u>3.4</u>	_____

Knowledge of the physical connections and/or cause-effect relationships between the MFW and the following systems:
AFW system

Proposed Question: Common 17

Given the following:

- The plant is at 25% power.
- “A” Main Feedwater Pump is in service.
- “B” Main Feedwater Pump is stopped.
- Subsequently, “A” Main Feedwater Pump trips.
- All systems operate as designed.
- SG levels are as follows:
 - A SG 20%
 - B SG 16%
 - C SG 18%
 - D SG 21%

Which ONE (1) of the following describes the effect on Auxiliary Feedwater Pump operation?

- A. NO AFW pumps have started.
- B. ONLY the TDAFW Pump is running.
- C. ONLY the MDAFW Pumps are running.
- D. TDAFW AND MDAFW Pumps are running.

Proposed Answer: C

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Question #18

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>061 K2.02</u>	_____
Importance Rating	<u>3.7</u>	_____

Knowledge of bus power supplies to the following: AFW electric driven pump
Proposed Question: Common 18

Given the following conditions:

- The plant is at 100% power.
- The TDAFP is out of service.
- A lockout of NB02 occurs.
- The plant trips and all equipment operates as designed.
- NB02 remains deenergized.

Which ONE (1) of the following states the steam generators that are currently being supplied by Auxiliary Feedwater?

- A. SGs A and B.
- B. SGs A and D.
- C. SGs B and C.
- D. SGs B and D.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. AFW pump B supplies A and D. NB02 supplies power to AFW Pump B
- B. Incorrect. Supplied by MDAFW pump B.
- C. Correct. These 2 steam generators are supplied by MDAFW pump A, which still has power.
- D. Incorrect. B MDAFW pump supplies, D, B would be supplied by MDAFW A.

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Technical Reference(s):	Lesson Aux Feedwater <hr/> AL system print <hr/>	(Attach if not previously provided)
Proposed references to be provided to applicants during examination:		None <hr/>
Learning Objective:	<u>Aux Feedwater – C.</u>	(As available)
Question Source:	Bank # _____ Modified Bank # <u>X</u> _____ New _____	(Note changes or attach parent)
Question History:	Last NRC Exam _____	
Question Cognitive Level:	Memory or Fundamental Knowledge _____ Comprehension or Analysis <u>X</u> _____	
10 CFR Part 55 Content:	55.41 <u>X</u> _____ 55.43 _____	
Comments:		

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Question #19

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>062 K3.01</u>	_____
Importance Rating	<u>3.5</u>	_____

Knowledge of the effect that a loss or malfunction of the ac distribution system will have on the following: Major system loads

Proposed Question: Common 19

Initial conditions:

- Reactor power is 100%.
- The crew is swapping CCW pumps.
- Currently A and C CCW pumps are RUNNING.
- B and D CCW pumps are in Standby.

Current Conditions:

- A loss of Off-Site power occurs.
- The diesel generators start and re-energize their respective busses.
- All equipment operates as designed.

Which ONE (1) of the following describes the CCW pumps that will be running?

- A. A and C CCW Pumps only.
- B. A and B CCW Pumps only.
- C. B and C CCW Pumps only.
- D. A, B and C CCW Pumps.

Proposed Answer: B

Explanation (Optional):

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- A. Incorrect. The loss of power to NB02 will start a pump (B) on that bus, the A pump will also receive a start signal.
- B. Correct. A loss of site power will cause all the CCW pumps to be shed from their associated NB bus. They are then sequenced back on by the shutdown sequencer. At the 5 second step in the load sequence, pumps A and B will start. Pumps C or D will start at the 10 second step if their associated pump (A or B) fails to start.
- C. Incorrect. C will only start if A does not.
- D. Incorrect. See above

Technical Reference(s): CCW System Lesson, LP-10 (Attach if not previously provided)
CCW system simplified

Proposed references to be provided to applicants during examination: None

Learning Objective: Systems LP-10, Obj. B (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 X
 55.43 _____

Comments:

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Question #20

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>063 K2.01</u>	_____
	Importance Rating	<u>2.9</u>	_____

Knowledge of bus power supplies to the following: Major dc loads
 Proposed Question: Common 20

Given the following:

- DG NE01 is synchronized to the grid, carrying approximately 5 MWe.
- A loss of DC Bus NK01 occurs.

Which ONE (1) of the following describes the effect on the operation of the DG?

- A. DG trips due to actuation of the underfrequency relay.
- B. DG remains running; loss of control power to output breaker ONLY.
- C. DG trips due to actuation of the Generator Differential relay.
- D. DG remains running but cannot be shut down from the control room.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Would not trip, as underfrequency does not require DC power to actuate
- B. Incorrect. Output breaker does lose power, but EDG control is also affected
- C. Incorrect. Differential relay is energize to actuate and will not cause a trip on loss of power
- D. Correct.

Technical Reference(s) OTO-NK-00002 (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: Safeguards Power Sys – Obj B (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:
Watts Bar Audit 2007 Not used on NRC exam

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Question #21 Changed on Post Exam Comments (see Report 2007/301 for details)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>064 K6.08</u>	_____
	Importance Rating	<u>3.2</u>	_____

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

Proposed Question: Common 21

Given the following:

The plant is in Mode 1.

A leak exists in the "A" EDG Fuel Oil Storage Tank.

Level indicates as follows:

0845	86%
0900	85%
0915	83%
0930	81%
0945	77%

From the choices below, what was the EARLIEST time that "A" EDG was inoperable in accordance with technical specifications?

- A. 0900
- B. 0915
- C. 0930
- D. 0945

Proposed Answer: C and D (the TS surveillance provides two indicators with different

Explanation (Optional): acceptance criteria; Either C or D could be correct depending on which is used)

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Question #22

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>061 K5.02</u>	_____
	Importance Rating	<u>3.2</u>	_____

Knowledge of the operational implications as they apply to concepts as they apply to the AFW system: Decay heat sources and magnitude

Proposed Question: Common 22

Which ONE (1) of the following conditions will result in the MOST Auxiliary Feedwater System flow required to maintain SG levels constant following a reactor trip?

<u>Core Burnup</u>	<u>Initial Power Level</u>
A. 1,000 MWD/MTU	10%
B. 1,000 MWD/MTU	100%
C. 10,000 MWD/MTU	10%
D. 10,000 MWD/MTU	100%

Proposed Answer: D

Explanation (Optional):

A is incorrect. BOL, low power, less AFW flow required

B is incorrect. BOL, high power, less decay heat than EOL

C is incorrect. EOL low power, less decay heat than high power.

D is Correct.

Technical Reference(s) Reactor Trip T&AA (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

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Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:
WTSI Bank

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Question #23

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>073 A2.02</u>	_____
	Importance Rating	<u>2.7</u>	_____

Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
 Detector failure

Proposed Question: Common 23

Given the following:

- A Gas Decay Tank release is in progress.
- GH RE-23, Radwaste Bldg Exhaust and Gas Decay Tank Area Ventilation Monitor, has a CYAN indication on the RM-11.

Which ONE (1) of the following describes the reason for the indication, and the action required?

- A. The monitor has failed; contact I&C for investigation.
- B. The monitor has failed; stop the release and place GH RE-22 in service.
- C. The RM-11 console has failed; contact I&C for investigation.
- D. The RM-11 console has failed; locally monitor the release until completion.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. RE-22 is no longer used, although it is still in place
- C. Incorrect. RM-11 communication failure would not result in a CYAN detector
- D. Incorrect. RM-11 communication failure would not result in a CYAN detector

Technical Reference(s) OTA SP-RM011 (Attach if not previously provided)

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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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7, 10

Comments:

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Question #24

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	_____
Group #	1	_____
K/A #	076 G2.1.2	
Importance Rating	3.0	_____

Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.

Proposed Question: Common 24

Following shutdown sequencer actuation, both ESW pumps are running supplying ESW loads.

Two (2) Service Water pumps are running.
 The EO in the field reports Service Water pump discharge pressures are currently reading 80 psig.

Which ONE (1) of the following actions will be required?

- A. Stop one of the Service Water pumps to prevent pump runout.
- B. Stop one of the Service Water pumps to prevent pump and bearing damage.
- C. Leave both Service Water pumps running to meet system load requirements.
- D. Leave both Service Water pumps running to allow the systems to be crossed tied and the ESW pumps secured.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect, two pumps are normally running to meet system loads (prevent runout)
- B. Correct, with limited loads, both pumps running will cause system pressure to rise and go out of the normal band (60 - 70 psig).
- C. Incorrect, a pump should be secured – only supplying turbine building loads
- D. Incorrect, a pump should be secured - only supplying turbine building loads.

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Technical Reference(s): OTN-EA-00001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: Circ and Service Water Obj.G (As available)

Question Source: Bank # X

 Modified Bank # _____ (Note changes or attach parent)

 New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____

 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 _____

 55.43 5

Comments:

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Question #25

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>076 A1.02</u>	
	Importance Rating	<u>2.6</u>	_____

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

Proposed Question: Common 25

Given the following:

- The plant is at 60% power.
- The following alarm is received:
 - 130E, GENERATOR AUX TROUBLE
- A report from the field indicates that the local alarm is 3A, MACH GAS TEMPERATURE HIGH
- Generator Gas temperature indicates 60 degrees C
- The CRS enters OTO-MA-00004, Generator Gas System Malfunction (Temperature)
- Five minutes later, Generator Gas temperature indicates 62 degrees C
- EATV0007, Generator H2 Cooler Temperature Control Valve, is approximately 50% open

Which ONE (1) of the following actions is required in accordance with OTO-MA-00004?

- A. Trip the reactor and enter E-0, Reactor Trip or Safety Injection.
- B. Trip the Turbine and go to OTO-AC-00001, Turbine Trip Below P-9.
- C. Fail open EATV0007 and manually operate EAV0037, Generator H2 Coolers Service Water Outlet Isolation, to maintain Generator H2 temperature.
- D. Hold MWe and MVAR stable while determining the cause. Throttle open

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EATV0007 to maintain Generator H2 temperature.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Only if condition lasted for 15 minutes
- B. Incorrect. Only if > 15 minutes and <P-9
- C. Correct.
- D. Incorrect. Will reduce load and MVAR load to attempt to reduce cooling load

Technical Reference(s) OTO- MA-00004 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #26

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>078 G2.4.50</u>	_____
Importance Rating	<u>3.3</u>	_____

Emergency Procedures / Plan Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Proposed Question: Common 26

Given the following:

- The plant is at 100% power.
- The following alarms are received:
 - 91A, Instrument Air Dryer Pressure Low
 - 92A, Compressed Air Pressure Low

Which ONE of the following describes the initial action(s) required?

- A. ONLY the LEAD and LAG compressors should be running; Dispatch an operator to determine the cause and start the 3rd air compressor.
- B. All available air compressors should be running; Dispatch an operator to determine the cause and verify the operation of all air compressors.
- C. ONLY the LEAD compressor should be running; Dispatch an operator to determine the cause and start the 2nd and 3rd air compressors.
- D. ONLY the LAG compressor should be running; Dispatch an operator to determine the cause and start the 2nd and 3rd air compressors.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Pressure is blow start pressure of 3rd compressor
- B. Correct.

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- C. Incorrect. Pressure is not low enough, and there would be another alarm
- D. Incorrect. Pressure is not low enough, and there would be another alarm

Technical Reference(s) OTA-RK-00024, ADD 91A and 92A (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #27

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	_____
	Group #	1	_____
	K/A #	103 A4.03	_____
	Importance Rating	2.7	_____

Ability to manually operate and/or monitor in the control room: ESF slave relays
 Proposed Question: Common 27

Given the following conditions:

- A LOCA has occurred.
- Containment Pressure is 28 psig and rising.
- All required actuations have occurred.

Which ONE (1) of the following describes the conditions required and operation of relays to reset Containment Isolation Phase B?

- A. The Phase B slave relays are de-energized when the Phase B control switch is placed in RESET. Components may be repositioned as required.
- B. The Phase B master relay is de-energized when the control switch is placed in RESET. When the master relay is de-energized, components may be repositioned.
- C. Containment Spray must be reset to allow resetting the master relay for Phase B. Placing the Phase B control switch to RESET will de-energize the slave relays to allow components to be repositioned.
- D. Initiating condition must clear and control switch must be placed in RESET to de-energize the slave relays that allow components to be repositioned.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Master relay only operates on the actuation signal. When resetting, slave relays reset
- C. Incorrect. Spray and CIB have independent resets, even though initiating signal is

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Question #28

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>103 K3.01</u>	_____
	Importance Rating	<u>3.3</u>	_____

Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under shutdown conditions

Proposed Question: Common 28

Given the following:

- The plant is in Mode 6.
- Core off-load is in progress.
- "A" RHR Train is in operation.
- "B" RHR Train is available.

Which ONE (1) of the following situations requires immediate suspension of irradiated fuel movement? (Consider each individually)

- A. Refueling Cavity level is lowered to 24 feet.
- B. Both Containment Airlock doors are open.
- C. Equipment Hatch is closed with 2 bolts fastened.
- D. Containment Purge Supply Fan is declared inoperable.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Cavity level required to be above 23 feet, and 2 trains of RHR available anyway
- B. Incorrect. Both doors may be open as long as 1 is capable of being closed.
- C. Correct. Equipment door is required to be fastened by 4 bolts.
- D. Incorrect. Containment Purge inop does not require stopping refueling, only concern is containment purge radiation monitors being operable for refueling

Technical Reference(s) TS 3.9.4 & 3.9.5 (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:
Sequoyah 2007

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Question #29

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>001 A4.10</u>	_____
	Importance Rating	<u>3.5</u>	_____

Ability to manually operate and/or monitor in the control room: Determination of an ECP

Proposed Question: Common 29

Given the following:

A reactor startup is in progress in accordance with OTG-ZZ-00002, Reactor Startup – IPTE.

While withdrawing Control Bank C in 50 step increments to its full out position, the RO determines that criticality will occur approximately 5 steps below the Rod Insertion Limit.

Which ONE (1) of the following is required in accordance with OTG-ZZ-00002?

- A. Immediately trip the reactor and enter E-0, Reactor Trip or Safety Injection.
- B. Stop control rod withdrawal and consult Reactor Engineering for guidance.
- C. Initiate RCS boration until adequate Shutdown Margin is obtained.
- D. Fully insert all control banks and recalculate the ECP.

Proposed Answer: D

Explanation (Optional):

A incorrect because trip not required unless inadvertent criticality

B incorrect because this applies if it appears criticality below ECP lower limit

C incorrect because there is no information available the SDM is not adequate

D correct

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Technical Reference(s) OTG ZZ-00002, step 5.1.21 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #30

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>2</u>	_____
K/A #	<u>002 K5.09</u>	_____
Importance Rating	<u>3.7</u>	_____

Knowledge of the operational implications of the following as they apply to the RCS: Relationship of pressure and temperature for water at saturation and subcooling conditions

Proposed Question: Common 30

Given the following conditions:

- The plant tripped due to a loss of off-site power.
- The crew is performing actions of ES-0.1, Reactor Trip Response.
- RCS pressure is currently 2050 psig.
- CETs indicate 621 degrees F and increasing slowly.

Which ONE (1) of the following describes the conditions currently present in the RCS, and the status of natural circulation flow IAW EOP Addendum 1, Natural Circulation Verification?

- A. Saturated conditions; Natural Circulation flow in the RCS is established.
- B. Subcooled conditions; Natural Circulation flow in the RCS is established.
- C. Saturated conditions; Natural Circulation flow in the RCS is NOT established.
- D. Subcooled conditions; Natural Circulation flow in the RCS is NOT established.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Not at saturation
- B. Incorrect. Natural Circ is not verified because subcooling is too low. Must be 30 degrees F
- C. Incorrect. Conditions do not indicate saturation
- D. Correct. Saturation for 2050 psig is approximately 639 degrees F. Subcooling at this point is still 18 degrees but must be 30 degrees for Natural Circ verification

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Technical Reference(s) ES-0.1 and EOP Addendum (Attach if not previously
1 provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:
WTSI Bank

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Question #31

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>011 K4.03</u>	_____
	Importance Rating	<u>2.6</u>	_____

Knowledge of PZR LCS design feature(s) and/or interlock(s) which provide for the following: Density compensation of PZR level

Proposed Question: Common 31

Which ONE (1) of the following Pressurizer Level instruments is COLD calibrated, and how does its indication differ from the other pressurizer level instruments at normal operating temperature and pressure?

- A. LT-461; indicates higher.
- B. LT-461; indicates lower.
- C. LT-462; indicates higher.
- D. LT-462; indicates lower.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Wrong transmitter, and cold cal indicates lower due to lack of density compensation
- B. Incorrect. Wrong transmitter
- C. Incorrect. Wrong level indication
- D. Correct.

Technical Reference(s) OTG-ZZ-00006, pg 8 & 54 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:
WTSI 42927 Braidwood

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Question #32

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>016 K3.12</u>	_____
	Importance Rating	<u>3.4</u>	_____

Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: S/G
 Proposed Question: Common 32

With the plant stable at 100% power, assuming no action by the crew, which ONE (1) of the following will cause actual S/G level to rise?

- A. Controlling SG level transmitter fails low
- B. Controlling Steam Flow transmitter fails low
- C. Feedwater Regulating Valve controller fails to MANUAL
- D. SG program level setpoint signal fails low

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. If steam flow fails low, then feed will follow and level will initially lower
- C. Incorrect. If valve controller failed to manual and no transient in progress, valve would remain in position
- D. Incorrect. If level setpoint failed low, then actual level would seem high, and the system would cut back on feed

Technical Reference(s) OTA-RK-00024 Add 108A, 109A, 110A, 111A (Attach if not previously provided)
Main Feedwater System LP

Proposed references to be provided to applicants during examination: None

Learning Objective: Main Feedwater System LP (As available)

Question Source: Bank # X

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Modified Bank # _____ (Note changes or attach
parent)

New _____

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 4

Comments:
WTSI generic

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Question #33

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>2</u>	_____
K/A #	<u>029 A1.02</u>	_____
Importance Rating	<u>3.4</u>	_____

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Containment Purge System controls including: Radiation levels

Proposed Question: Common 33

Given the following conditions:

- The plant is in Mode 6.
- Refueling is in progress.
- Containment S/D Purge is in service.
- A damaged fuel assembly is being withdrawn from the core.
- Containment Radiation levels are rising.

Which ONE (1) of the following describes the minimum detector response that will generate a Containment Purge Isolation Signal (CPIS)?

- A. When EITHER GT RE-31 OR GT RE-32 reach the HI-HI setpoint.
- B. When GT RE-31 AND GT RE-32 BOTH reach the HI-HI setpoint.
- C. When EITHER GT RE-22 OR GT RE-33 reach the HI-HI setpoint.
- D. When GT RE-22 AND GT RE-33 BOTH reach the HI-HI setpoint.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Containment Atmosphere monitors – do not input to isolation, although they monitor the same process
- B. Incorrect. Containment Atmosphere monitors – do not input to isolation, although they monitor the same process
- C. Correct.
- D. Incorrect. Only 1 of 2 required

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Technical Reference(s) 7250D64 S008 (Attach if not previously provided)
LP 40 – Containment Vent

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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 11

Comments:

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Question #34

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>045 K1.06</u>	_____
	Importance Rating	<u>2.6</u>	_____

Knowledge of the physical connections and/or cause-effect relationships between the MT/G system and the following systems: RCS, during steam valve test

Proposed Question: Common 34

The Callaway Plant is operating at 85% power and 580 °F Tave at the end of core life. During Main Turbine testing a failure of the turbine control system valves occurs, which allows 10% more steam flow to the main turbine. No operator actions occur and no protective actions occur. Rod control is in Manual.

Following the transient, reactor power will stabilize _____ 85% and Tave will stabilize _____ 580 °F.

- A. below; below
- B. above; below
- C. below; above
- D. above; above

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Negative MTC would increase power
- B. Correct. At EOL MTC really negative
- C. Incorrect. Steam demand will raise power
- D. Incorrect. Increased steam demand lowers temperature

Technical Reference(s) OSP-AC-00003 (Attach if not previously provided)

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OTG-ZZ-00004

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:
Question P1570

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Question #35

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>068 K6.10</u>	_____
	Importance Rating	<u>2.5</u>	_____

Knowledge of the effect of a loss or malfunction on the following will have on the Liquid Radwaste System : Radiation monitors

Proposed Question: Common 35

A liquid radioactive release from Discharge Monitor Tank (DMT) 'A' is in progress.

HB-RE-18, Liquid Radwaste Discharge Monitor fails full scale HIGH.

Which ONE (1) of the following describes the effect on the DMT release?

- A. The release may CONTINUE if FSAR samples are taken.
- B. The release must be MANUALLY terminated.
- C. The release may CONTINUE if nothing has been added to the tank since the sample was taken.
- D. The release is AUTOMATICALLY terminated.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect.
- B. Incorrect.
- C. Incorrect.
- D. Correct. HB-RE-18 will automatically close the DMT discharge valve on high radiation level

Technical Reference(s)	T61.0110 6, LP-16, Systems	(Attach if not previously provided)
	<u>OTA-SP-RM011</u>	

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Proposed references to be provided to applicants during examination: None

Learning Objective: Systems – Radwaste, Obj F & G (As available)

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

Question History: Last NRC Exam 2004

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

10 CFR Part 55 Content: 55.41 5, 11

Comments:

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Question #36

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>071 K5.04</u>	_____
	Importance Rating	<u>2.5</u>	_____

Knowledge of the operational implication of the following concepts as they apply to the Waste Gas Disposal System:
 Relationship of hydrogen/oxygen concentrations to flammability

Proposed Question: Common 36

The Waste Gas Holdup system has a hydrogen concentration of 4.2%.

Which ONE (1) of the following is the MAXIMUM oxygen concentration allowed by FSAR technical specifications to prevent an explosive mixture?

- A. 1%
- B. 2%
- C. 3%
- D. 4%

Proposed Answer: C

Explanation (Optional):

- A. Incorrect.
- B. Incorrect.
- C. Correct.
- D. Incorrect.

Technical Reference(s) TS 16.11.2.6 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 13

Comments:

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Question #37

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>014 A2.03</u>	
	Importance Rating	<u>3.6</u>	_____

Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
 Dropped Rod

Proposed Question: Common 37

Given the following:

- Rod control has been selected to the Shutdown Bank A position to realign a dropped rod in accordance with OTO SF-00001, Rod Control System Malfunctions.

Which ONE (1) of the following describes the effect of moving the rod on the Rod Position Indication System?

- A. ONLY the Step Counter must be reset prior to repositioning the affected rod.
- B. The Rod Position Indication URGENT Failure alarm must be reset prior to repositioning the affected rod.
- C. ONLY the Bank Overlap Unit must be reset prior to repositioning the affected rod.
- D. The Step Counter and the Bank Overlap Unit must be reset prior to repositioning the affected rod.

Proposed Answer: A

Explanation (Optional):

A is Correct.

B is incorrect. There should be no urgent failure of IRPI. It is a dropped rod. Could confuse IRPI urgent failure with a rod control urgent failure. Rod Control Urgent failure would/could have occurred if the failure were on a control bank and demand were encountered prior to selecting Bank Select.

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C is incorrect. The rod movement will cause the demand counters to move to a new position. When complete, SF-00001 has the demand counters set to their original position. Shutdown Bank rods do not impact the Bank Overlap Unit.
 D is incorrect. Shutdown Bank rods do not impact the Bank Overlap Unit.

Technical Reference(s) OTO-SF-00001, Att B (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 6

Comments:

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Question #38

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>2</u>	_____
Group #	<u>2</u>	_____
K/A #	<u>086 G2.1.23</u>	_____
Importance Rating	<u>3.9</u>	_____

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Proposed Question: Common 38

Given the following:

- The plant is at 100% power.
- Due to a system perturbation, the Fire Protection System Header pressure momentarily decreases to 110 psig, and then rises above its normal value.
- All equipment operates as designed.

Which ONE (1) of the following describes the action required in relation to the operation of Fire Protection Pumps?

- A. Secure the Electric Fire Pump ONLY. The diesel Driven Pumps did not start.
- B. Secure both Diesel Fire Pumps. The Electric Fire Pump did not start.
- C. Ensure the Jockey Pump is operating as required. NO Fire Pumps started.
- D. Secure both the Electric Fire Pump and the Diesel Fire Pumps.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Pressure went below the lowest setpoint for Diesel Pumps
- B. Incorrect. Electric Fire Pump will be running if Diesels are running
- C. Incorrect. Will check anyway, but other pumps will be running too
- D. Correct.

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Question #39

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>007 EK2.03</u>	<u> </u>
	Importance Rating	<u>3.5</u>	<u> </u>

Knowledge of the interrelations between a reactor trip and the following: Reactor trip status panel
 Proposed Question: Common 39

A reactor trip has occurred.

Which ONE (1) of the following describes the indication on the FIRST OUT annunciator panel?

- A. The first condition received will 'slow flash' a red annunciator window. The second condition received will slow flash a white annunciator window.
- B. The first condition received will 'fast flash' a red annunciator window. The second condition received will fast flash a white annunciator window.
- C. The first condition received will 'slow flash' a red annunciator window. The second condition received will slow flash a red annunciator window.
- D. The first condition received will 'fast flash' a red annunciator window. The second condition received will slow flash a red annunciator window.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. First out will fast flash. Subsequent will fast flash
- B. Correct.
- C. Incorrect. First out will fast flash. Second out will be white
- D. Incorrect. Second out is fast flash white

Technical Reference(s) LP 58 (Attach if not previously provided)

Proposed references to be provided to applicants during None

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examination: _____

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:

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Question #40

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	_____
Group #	1	_____
K/A #	008 AK3.05	
Importance Rating	4.0	_____

Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: ECCS termination or throttling criteria

Proposed Question: Common 40

Given the following:

- Reactor trip and safety injection have occurred.
- The crew is evaluating SI Termination criteria.
- The following conditions exist:
 - RCS pressure is 1200 psig and stable
 - RCS temperature is 560 degrees F
 - PZR level is off-scale high
 - RVLIS PUMPS OFF is 80%
 - Total AFW flow is 390,000 lbm/hr.
 - SG NR levels re off-scale low.

Which ONE (1) of the following describes whether SI may be terminated, and the reason why?

- A. SI Termination criteria is met because RCS inventory and heat removal functions are satisfied and RCS overpressurization must be prevented due to pressurizer overfill.
- B. SG NR levels must be raised prior to SI Termination because secondary inventory is inadequate to prevent a challenge to the Heat Sink Critical Safety Function.
- C. RCS Subcooling must be raised prior to SI Termination because a pressurizer vapor space accident is in progress and core uncovering may occur.

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D. RVLIS must be raised prior to SI Termination because a pressurizer vapor space accident is in progress and core uncover may occur.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. RCS subcooling is nearly 0
- B. Incorrect. SG levels low, but heat sink satisfied by AFW flow
- C. Correct.
- D. Incorrect. RVLIS not criteria, although it can be an indication of potential RCS saturation

Technical Reference(s) ES-1.1, E-0 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #41

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>1</u>	<u> </u>
Group #	<u>1</u>	<u> </u>
K/A #	<u>009 G2.1.23</u>	<u> </u>
Importance Rating	<u>3.9</u>	<u> </u>

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Proposed Question: Common 41

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.
- SI pumps have been stopped.
- Normal Charging is aligned.
- The crew is depressurizing the RCS using normal spray.

Which ONE (1) 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 presurizer level remains above the lower limit to allow PZR heater operation during the RCS cooldown

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. RCP operation is desired but not required
- B. Correct.
- C. Incorrect. Maximizing subcooling would help this, but it is not a strategy of this procedure
- D. Incorrect. Correct answer but wrong reason. Minimizing subcooling will keep PZR

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level higher, but not part of strategy

Technical Reference(s) ES-1.2 and BD (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #42

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>011 EA1.05</u>	<u> </u>
	Importance Rating	<u>4.3</u>	<u> </u>

Ability to operate and monitor the following as they apply to a Large Break LOCA: Manual and/or automatic transfer of suction of charging pumps to borated source

Proposed Question: Common 42

Given the following:

- The plant is at 100% power.
- VCT Level Transmitter BG LT-185 is failed HIGH.
- Prior to any action by the crew, a Large Break LOCA occurred.
- All equipment operated as designed.

Which ONE (1) of the following describes the Charging Pump suction alignment?

- A. Both Charging pumps are taking suction from the VCT.
- B. Both Charging Pumps are taking suction from the RWST.
- C. Charging Pump 'A' is taking suction from the VCT. Charging Pump 'B' is taking suction from the RWST.
- D. Charging Pump 'A' is taking suction from the RWST. Charging Pump 'B' is taking suction from the VCT.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. LT-185 would feed B train, but only on VCT low level swapover.
- B. Correct. SI will cause suction to shift
- C. Incorrect. Would be correct if VCT low level, but not SI
- D. Incorrect. Wrong train, but same as C

Technical Reference(s) CVCS LP (Attach if not previously

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_____ provided)

Proposed references to be provided to applicants during examination: _____ None

Learning Objective: Systems CVCS, Obj C (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:

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Question #43

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>1</u>	<u> </u>
Group #	<u>1</u>	<u> </u>
K/A #	<u>022 G2.1.33</u>	<u> </u>
Importance Rating	<u>3.4</u>	<u> </u>

Conduct of Operations: Ability to recognize indications for system operating parameters which are entry level conditions for technical specifications

Proposed Question: Common 43

Given the following:

- The plant is at 100% power.
- All control systems are in normal alignments.
- Charging flow has been rising and is currently at 145 GPM.
- Letdown temperature downstream of the Regenerative Heat Exchanger has lowered slightly from its steady state value.
- VCT level is lowering.
- PZR level is lowering slowly.
- RCS temperature is stable.

Which ONE (1) of the following describes the effect on the unit and the action required?

- A. RCS leakage is from the charging line upstream of the regenerative heat exchanger. Leakage is within technical specification limits.
- B. RCS leakage is from the charging line upstream of the regenerative heat exchanger. Leakage is greater than technical specification limits.
- C. RCS leakage is from the charging line downstream of the regenerative heat exchanger. Leakage is within technical specification limits.
- D. RCS leakage is from the charging line downstream of the regenerative heat exchanger. Leakage is greater than technical specification limits.

Proposed Answer: D

Explanation (Optional):

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- A. Incorrect. Wrong location of leak, wrong action
- B. Incorrect. Wrong location, correct action
- C. Incorrect. Leakage is not within TS limits
- D. Correct. If RHX Outlet temperature is lowering, then more charging flow is going through the RHX. This means the leak is downstream of the RHX in containment. Since Charging flow increased from a normal value of 132 GPM to 145 GPM with no other changes, leakage is greater than TS limits.

Technical Reference(s) TS 3.4.13 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

Question Source: Bank # X

 Modified Bank # _____ (Note changes or attach parent)

 New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____

 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10

 2

Comments:

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Question #44

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>1</u>	<u> </u>
Group #	<u>1</u>	<u> </u>
K/A #	<u>026 AA2.06</u>	<u> </u>
Importance Rating	<u>2.8</u>	<u> </u>

Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The length of time after the loss of CCW flow to a component before that component may be damaged

Proposed Question: Common 44

Given the following:

- The plant is at 100% power.
- CCW was lost to the RCPs 2 minutes ago.
- The crew is performing action in accordance with OTO-BB-00002, RCP Off-Normal.
- All RCP parameters are approximately equal on each RCP as shown:
 - Motor bearing temperatures – 180 degrees F and rising at 3 degrees F per minute
 - Motor Stator Winding temperatures – 306 degrees F and rising at 5 degrees F per minute.

Assuming the current trends continue, how much longer before the RCP trip criteria is met?

- A. 1 minute
- B. 2 minutes
- C. 5 minutes
- D. 8 minutes

Proposed Answer: A

Explanation (Optional):

A. Correct.

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- B. Incorrect. Stator will be at limit in 1 minute
- C. Incorrect. Stator will be at limit in 1 minute
- D. Incorrect. Correct for motor bearing but stator will be at limit already

Technical Reference(s) OTO BB-00002, Att. C (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #45 **Changed on Post Exam Comments**

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>027 AK2.03</u>	<u> </u>
	Importance Rating	<u>2.6</u>	<u> </u>

Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: Controllers and positioners

Proposed Question: Common 45

Given the following:

- The plant is operating at 100% power.
- A failure of the controlling input to the Pressurizer Pressure Master Controller caused actual pressurizer pressure to increase to 2285 psig.
- The Pressurizer Pressure Master Controller has been placed in MANUAL.

Which ONE (1) of the following describes the action required to return pressure to 2235 psig?

- A. Decrease the controller output
- B. Increase the controller output
- C. Lower the pressure setpoint adjustment
- D. Raise the pressure setpoint adjustment

Proposed Answer: B **A**

Explanation (Optional):

- A. ~~Incorrect. Lowering output will raise pressure.~~ **Correct**
- B. ~~Correct.~~ **Incorrect. Raising controller output raises pressure**
- C. Incorrect. Setpoint adjustment will not operate in manual
- D. Incorrect. Setpoint adjustment will not operate in manual

Technical Reference(s) OTO-BB-00006 (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7, 10

Comments:

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Question #46

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>029 EK2.06</u>	_____
	Importance Rating	<u>2.9</u>	_____

Knowledge of the interrelations between the _____ and the following an ATWS: Breakers, relays, and disconnects
 Proposed Question: Common 46

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 manual reactor trip.
- The RO attempts to manually trip the reactor but the reactor does NOT trip.

Which ONE (1) of the following describes a failure that has contributed to the reactor trip failure?

- A. Reactor Trip Breaker "B" Undervoltage Trip coil failed to energize.
- B. Reactor Trip Breaker "B" Shunt Trip coil failed to deenergize.
- C. Reactor Trip Bypass Breaker "A" Undervoltage Trip coil failed to deenergize.
- D. Reactor Trip Bypass Breaker "A" Shunt Trip coil failed to de-energize.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Trip coil is normally energized
- B. Incorrect. Shunt trip coil is normally de-energized, and energizes to actuate
- C. Correct.
- D. Incorrect. Would be correct for RTBB A, but RTBB B is not required to open

Technical Reference(s) 7250D64-S002 (Attach if not previously

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_____ provided)

Proposed references to be provided to applicants during examination: _____ None

Learning Objective: Rod Control System, Obj T (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:

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Question #47

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>038 EK1.03</u>	<u> </u>
	Importance Rating	<u>3.9</u>	<u> </u>

Knowledge of the operational implications of the following concepts as they apply to the SGTR: Natural circulation
 Proposed Question: Common 47

Given the following:

- A Steam Generator Tube Rupture has occurred.
- Off-Site power has been lost.
- Both EDG's are operating as required.

Which ONE (1) of the following describes a plant condition that may result from actions taken during the performance of E-3, Steam Generator Tube Rupture, for these conditions?

- A. Voiding in the inactive regions of the RCS during the rapid RCS cooldown to target temperature.
- B. Loss of RCS subcooling during depressurization using main or auxiliary spray.
- C. Loss of RCS subcooling due to the time required to cooldown to target temperature with condenser steam dump unavailable.
- D. Voiding in the inactive regions of the RCS during depressurization using PZR PORVs.

Proposed Answer: D

Explanation (Optional):

D is correct. Loss of power, no RCPs, depressurization must be performed with PORVs.

A is incorrect because initial cooldown is performed at higher pressure prior to RCS reaching saturation

B is incorrect because Main spray will not be available with a LOOP

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C is incorrect because cooldown to target is performed quickly, even if using PORVs

Note: This test item meets the KA because the operational concern associated with natural circulation during a SGTR is that RCPs are not available, making main spray unavailable. Therefore, PZR PORVs must be used to depressurize the RCS, resulting in potential voiding

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

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:
WTSI 55715 Farley 2005

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Question #48

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>040 AA1.01</u>	<u> </u>
	Importance Rating	<u>4.6</u>	<u> </u>

Ability to operate and / or monitor the following as they apply to the Steam Line Rupture: Manual and automatic ESFAS actuation

Proposed Question: Common 48

A plant shutdown is in progress with the following conditions:

- Pressurizer pressure is 1850 psig.
- Steam line pressure is 750 psig.
- All other conditions are normal.
- Actions required to block ESF actuations have been performed.

A large steam break occurs upstream of 'B' MSIV resulting in a complete depressurization of 'B' steam generator in 1 minute.

No manual action is taken.

Which ONE (1) of the following describes the ESF actuations initiated?

- A. SLIS ONLY due to high negative rate of 'B' steam line pressure.
- B. SLIS ONLY due to low 'B' steam line pressure.
- C. SI ONLY due to high negative rate of 'B' steam line pressure.
- D. SI and SLIS due to low 'B' steam line pressure.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Below P-11 low steam pressure is blocked
- C. Incorrect. SI is blocked
- D. Incorrect. SI is blocked

Technical Reference(s) OTO-SA-00001 (Attach if not previously

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_____ provided)

Proposed references to be provided to applicants during examination: _____ None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:

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Question #49

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>054 AK1.01</u>	<u> </u>
	Importance Rating	<u>4.1</u>	<u> </u>

Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW):
 MFW line break depressurizes the S/G (similar to a steam line break)

Proposed Question: Common 49

Given the following plant conditions:

- The plant is operating at 100% power.
- A Feedwater Line Break occurs at the piping connection to "A" SG.

Which ONE (1) of the following describes the effect of this event?

- A. RCS temperature rises prior to reactor trip. SG "A" continues to depressurize after FWIV closure.
- B. RCS temperature lowers prior to reactor trip. SG "A" continues to depressurize after FWIV closure.
- C. RCS temperature lowers prior to reactor trip. SG "A" pressure stabilizes after MSIV closure.
- D. RCS temperature rises prior to reactor trip. SG "A" pressure stabilizes after MSIV closure.

Proposed Answer: A

Explanation (Optional):

A Correct. Prior to the trip, less FW being supplied to SG will cause temperature to rise. When reactor trip occurs, Feedwater will be discontinued to SG, and since there is no check valve downstream of the break, the SG will depressurize like a steam line break

B Incorrect. RCS temperature will not lower pre-trip because feed is not getting to SG, so SG heats up, causing higher RCS temperature.

C Incorrect. RCS temperature wrong direction. SG pressure will not stabilize because MSLI will not isolate the break

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D Incorrect. MSLI will not isolate the break

Applicant must know location of MF and AFW check valves and actuation of MFIV and MSLI for this item

Technical Reference(s) E-2 Bases _____ (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____ None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 4

Comments:

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Question #50

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	055 EK1.01	_____
	Importance Rating	3.3	_____

Knowledge of the operational implications of the following concepts as they apply to the Station Blackout : Effect of battery discharge rates on capacity

Proposed Question: Common 50

During the performance of ECA-0.0, Loss of All AC Power, battery NK11 discharge ammeter is reading 275 amps.

Which ONE (1) of the following is the MAXIMUM time that NK01 could remain functional assuming the battery was fully charged initially?

- A. 2 hours.
- B. 4 hours.
- C. 6 hours.
- D. 8 hours.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect.
- B. Incorrect.
- C. Correct.
- D. Incorrect.

Technical Reference(s) ECA-0.0 BD _____ (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____ None

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Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #51

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>056 AA2.88</u>	<u> </u>
	Importance Rating	<u>4.1</u>	<u> </u>

Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Necessary S/G water level for natural circulation

Proposed Question: Common 51

Given the following:

- A loss of off-site power has occurred.
- The crew is performing ES-0.1, Reactor Trip Response.
- RCS Tave is approximately 565 degrees F

Which ONE (1) of the following describes the feedwater arrangement that will be maintaining SG level, and the MINIMUM requirements to maintain heat sink?

- A. Main Feedwater Pumps; at least 7% NR in ALL SGs.
- B. Main Feedwater Pumps; at least 7% NR in ANY ONE SG.
- C. Auxiliary Feedwater Pumps; at least 7% NR in ALL SGs.
- D. Auxiliary Feedwater Pumps; at least 7% NR in ANY ONE SG.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Main feed not available with loss of off site power. Credible because Tave has not caused feedwater isolation
- B. Incorrect. Main Feed not available
- C. Incorrect. 7% NR requirement is minimum in any SG, not required to have all
- D. Correct.

Technical Reference(s) ES-0.1 (Attach if not previously

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_____ 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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #52

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>1</u>	<u> </u>
Group #	<u>1</u>	<u> </u>
K/A #	<u>058 G2.1.28</u>	<u> </u>
Importance Rating	<u>3.2</u>	<u> </u>

Knowledge of purpose and function of major system components and controls
Proposed Question: Common 52

Given the following:

- The plant is in Mode 3.
- A and B MDAFW Pumps are in service feeding all 4 SGs.
- 125 VDC control power to the B MDAFW Pump is lost.

Which ONE (1) of the following describes the effect on the operation of B MDAFW Pump?

- A. Breaker indication in Control room is lost
Remote breaker control is lost
Pump remains running

- B. Breaker indication in Control room is available
Remote breaker control is lost
Pump will remain running

- C. Breaker indication in Control room is lost
Remote breaker control is available
Pump will trip

- D. Breaker indication in Control room is available
Remote breaker control is available
Pump will trip

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Control room indication is lost
- C. Incorrect. Pump will not trip if running

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D. Incorrect. Control room indication is lost, pump will not trip if running

Technical Reference(s) OTO-NK-00002 (Attach if not previously provided)
E-23AL01B

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:

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Question #53

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>E05 EK3.2</u>	
	Importance Rating	<u>3.7</u>	_____

Knowledge of the reasons for the following responses as they apply to the Loss of Secondary Heat Sink: Normal, abnormal, and emergency operating procedures associated with a loss of secondary heat sink

Proposed Question: Common 53

Which ONE (1) of the following is the primary reason for stopping all RCP's in FR-H.1, Response to Loss of Secondary Heat Sink?

- A. This will establish natural circulation conditions and will tend to mitigate the loss of secondary heat sink by establishing a delta T across the core.
- B. They are secured to reduce the heat added from the RCPs, thereby delaying the need for bleed and feed and gaining time to establish a means of supplying FW to a S/G.
- C. They are secured to prevent the heat added by the RCPs from adversely affecting indications used to determine whether or not RCS bleed and feed will be required.
- D. This will reduce RCS pressure enough to ensure bleed and feed is adequate for RCS cooling requirements.

Proposed Answer: B

Explanation (Optional):

A is incorrect, because Natural Circulation will not mitigate the event.

B is correct,

C is incorrect because although RCPs do affect heat input, they do not affect the indication for determination of bleed and feed requirements.

D is incorrect because the action to open PORVs will reduce RCS pressure enough to ensure adequate flow

Technical Reference(s) FR-H.1 BD

(Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #54

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>065 AK3.04</u>	<u> </u>
	Importance Rating	<u>3.0</u>	<u> </u>

Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Cross-over to backup air supplies

Proposed Question: Common 54

Given the following:

- The plant is at 100% power.
- A loss of instrument air has occurred.
- Instrument Air Header pressure is currently 110 psig and lowering.

Which ONE (1) of the following describes the operation of the Service Air Header cross-connect valve, KAPV0011 for this event?

- A. Receives a signal to close at 100 psig decreasing to isolate a potential leak in the Service Air Header
- B. Receives a signal to close at 110 psig decreasing to isolate a potential leak in the Service Air Header
- C. Receives a signal to open at 100 psig decreasing to assist in maintaining Instrument Air Header pressure
- D. Receives a signal to open at 110 psig decreasing to assist in maintaining Instrument Air Header pressure

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Wrong pressure, signal is received at 110 psig
- B. Correct.
- C. Incorrect. Wrong direction. Valve is normally open
- D. Incorrect. Wrong direction. Valve is normally open

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Technical Reference(s) OTO-KA-00001 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 4

Comments:

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Question #55

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>1</u>	<u> </u>
	K/A #	<u>E04 EA2.2</u>	<u> </u>
	Importance Rating	<u>3.6</u>	<u> </u>

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: Common 55

Given the following conditions:

- A LOCA outside containment has occurred.
- The crew is performing the actions in ECA-1.2, LOCA OUTSIDE CONTAINMENT.
- RCS Cooldown is NOT in progress.

Which ONE (1) of the following indications is used to determine if the leak has been isolated in accordance with ECA-1.2?

- A. RCS pressure, because when the break is isolated, SI flow will repressurize the RCS.
- B. Pressurizer level, because when the break is isolated, RCS inventory will rapidly rise.
- C. Safety injection flow, because when the break is isolated, it is the first parameter that will change.
- D. RVLIS indication, because when the break is isolated, vessel head voiding will immediately be reduced.

Proposed Answer: A

Explanation (Optional):

- A. Correct. RCS pressure is the primary means of determining whether the leak is isolated.
- B. Incorrect. RCS inventory will increase, but may not immediately show up on PZR level
- C. Incorrect. SI Flow is a good confirmatory indication when RCS pressure

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rises, because it will be reduced, but RCS pressure rise is the only immediate indication

D. Incorrect. RVLIS may indicate 100% at the start, so may not provide indication of isolation at all

Technical Reference(s) ECA-1.2 BD (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

Question Source:

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

Question History: Last NRC Exam _____

Question Cognitive Level:

Memory or Fundamental Knowledge	X
Comprehension or Analysis	_____

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #56

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	E11 EA1.1	_____
	Importance Rating	3.9	_____

Ability to operate and / or monitor the following as they apply to the (Loss of Emergency Coolant Recirculation) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Proposed Question: Common 56

Given the following plant conditions:

- A LOCA has occurred.
- The crew is performing steps contained in ECA-1.1, Loss of Emergency Coolant Recirculation.
- RWST Level is 55% and lowering.
- Containment Fan Coolers are running as designed.
- Both Containment Spray Pumps are running.
- Containment pressure is 6 psig and LOWERING slowly.
- The CRS is evaluating the need for reducing Containment Spray.

Which ONE (1) of the following describes the action that is allowed to be taken and the reason that the action will be taken in accordance with ECA-1.1?

- A. Both Containment Spray Pumps should be immediately stopped due to imminent loss of NPSH.
- B. One Containment Spray Pump must remain running because Containment pressure remains above the HIGH-1 setpoint.
- C. One Containment Spray Pump must remain running to provide for Containment Iodine Removal.
- D. Both Containment Spray Pumps should be stopped because Containment Coolers can provide sufficient cooling at the current Containment pressure.

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Proposed Answer: D

Explanation (Optional):

- A. Incorrect. NPSH lost would be RWST at 6%
- B. Incorrect. All may be stopped
- C. Incorrect. Not necessary to leave 1 running in this procedure for this reason
- D. Incorrect.

Technical Reference(s) ECA-1.1 and BD _____ (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____ None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #57

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>2</u>	<u> </u>
	K/A #	<u>001 G2.1.7</u>	<u> </u>
	Importance Rating	<u>3.7</u>	<u> </u>

Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation

Proposed Question: Common 57

Given the following:

- The plant is at 85% power at MOL.
- A continuous uncontrolled control rod withdrawal occurs.

Which ONE (1) of the following parameter's initial change will be to DECREASE?

- A. Steam Generator pressure.
- B. Main Generator Electrical Output.
- C. Overpower Delta T setpoint.
- D. VCT level.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Will rise due to higher temperature
- B. Incorrect. Would rise due to higher steam flow
- C. Correct.
- D. Incorrect. Would rise due to lower charging flow with constant letdown

Technical Reference(s) Tech Spec 3.3.1 and bases (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

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Learning Objective: Systems – RPS, Obj. C (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:

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Question #58

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>024 AA2.03</u>	
	Importance Rating	<u>2.9</u>	_____

Ability to determine and interpret the following as they apply to the Emergency Boration: Correlation between boric acid controller setpoint and boric acid flow

Proposed Question: Common 58

Given the following:

- The crew is performing a rapid load reduction in accordance with OTO-MA-00008, Rapid Load Reduction.
- A Boration is initiated using the Emergency Boration flowpath.

Which ONE (1) of the following describes the boration alignment for this event?

- A. RCS Makeup Controller in BORATE with flow rate as determined by reactivity brief.
- B. RCS Makeup Controller in BORATE with flow rate greater than 30 GPM.
- C. RCS Makeup Controller in AUTO with flow rate as determined by reactivity brief.
- D. RCS Makeup Controller in AUTO with flow rate greater than 30 GPM.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Emergency path does not use the controller
- B. Incorrect. Emergency path does not use the controller
- C. Incorrect. Only normal boration provides for flow rate as determined by brief
- D. Correct.

Technical Reference(s) OTO-MA-00008 (Attach if not previously

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_____ 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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #59

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>2</u>	<u> </u>
	K/A #	<u>059 AK1.02</u>	<u> </u>
	Importance Rating	<u>2.6</u>	<u> </u>

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

Proposed Question: Common 59

Given the following plant conditions:

- An accidental spill of the Monitor Tank has occurred in the Aux Building.
- Radiation levels in the area of the spill are 40 mRem per hour at 30 cm.
- Contamination levels on the floor around the tank are 1.2E4 DPM/100 cm² beta-gamma.

Which ONE (1) of the following describes how the area will be posted in accordance with HDP-ZZ-01500, "Radiological Postings?"

- A. Radiation Area AND Contamination Area
- B. High Radiation Area AND Contamination Area
- C. Radiation Area AND High Contamination Area
- D. High Radiation Area AND High Contamination Area

Proposed Answer: A

Explanation (Optional):

- A. Correct. This area should be posted as a radiation area (>5 mrem and <100 mrem/hr) and a contamination area (>1000 dpm/100 cm²).
- B. Incorrect. Greater than 100 mrem/hr is a high radiation area.
- C. Incorrect. Greater than 100,000 dpm/100 cm² is a high contamination area.
- D. Incorrect. Greater than 100 mrem/hr is a high radiation area. Greater than 100,000 dpm/100 cm² is a high contamination area.

Technical Reference(s) HDP-ZZ-01500 (Attach if not previously

NRC Site-Specific Written Examination
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_____ provided)

Proposed references to be provided to applicants during examination: _____ None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 12

Comments:

NRC Site-Specific Written Examination
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Question #60

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>1</u>	<u> </u>
Group #	<u>2</u>	<u> </u>
K/A #	<u>069 AA2.02</u>	<u> </u>
Importance Rating	<u>3.9</u>	<u> </u>

Ability to determine and interpret the following as they apply to the Loss of Containment Integrity: Verification of automatic and manual means of restoring integrity

Proposed Question: Common 60

Given the following:

The plant is in Mode 1.

A Containment entry is in progress to perform on line maintenance.

The crew entering the Reactor Building reports that the gasket on the inner air lock door has been damaged. There is a gouge across the entire sealing surface approximately 1/8 inch deep and 1/2 inch wide and they could hear air flow through the gouge before they equalized pressure.

Which ONE (1) of the following describes the MINIMUM INITIAL action required to restore or maintain Containment Integrity in accordance with OTO-ZZ-00009, Loss of Containment Integrity?

- A. Close or verify closed BOTH Air Lock Doors immediately
- B. Close or verify closed BOTH Air Lock Doors within 1 hour
- C. Close or verify closed the OUTER Air Lock Door immediately
- D. Close or verify closed the OUTER Air Lock Door within 1 hour

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Both doors not required. Inner is inoperable
- B. Incorrect. Inner is inoperable
- C. Incorrect. Not required immediately
- D. Incorrect.

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Question #61

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	2	_____
	K/A #	076 AK2.01	_____
	Importance Rating	2.6	_____

Knowledge of the interrelations between the High Reactor Coolant Activity and the following: Process radiation monitors
Proposed Question: Common 61

Which ONE (1) of the following describes the radiation monitor that will provide direct confirmation of High RCS activity in accordance with OTO-BB-00005, RCS High Activity?

- A. GT RE-31, Containment Atmosphere
- B. AB RE-16A, B, C, D, SG N-16 Monitors
- C. SJ RE-01, CVCS Letdown Monitor
- D. GT RE-59, CTMT High Range Area Monitor

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Could provide backup indication if there was a leak in Containment
- B. Incorrect. Could provide additional indication if a SG tube leak existed
- C. Correct.
- D. Incorrect. Potentially if a LOCA occurred, or post accident

Technical Reference(s) OTO BB-00005 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____ None

Learning Objective: _____ (As available)

Question Source: Bank # _____

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Modified Bank # _____ (Note changes or attach
parent)

New X

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:

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Question #62

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	_____
Group #	2	_____
K/A #	E02 EK2.2	
Importance Rating	3.5	_____

Knowledge of the interrelations between the (SI Termination) 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: Common 62

A steam line break has occurred in the plant. Given the following plant conditions at the transition from E-2, FAULTED STEAM GENERATOR ISOLATION:

- Pressurizer pressure 1800 psig and stable
- Pressurizer level 24%
- RCS temperature (Tave) 538°F
- Containment Pressure 0.1 psig
- Steam Generator levels Approximately 30% NR
- Steam Generator pressures A, C, and D 970 psig and stable. B 850 psig and stable
- The leak has been isolated
- All ECCS pumps are running in the injection mode

The control room staff has entered ES-1.1, SI TERMINATION

Which ONE (1) of the following describes the sequence for stopping ECCS pumps?

- A. Stop all running charging pumps, SI pumps and RHR pumps
- B. Stop one charging pump, both SI pumps, and both RHR pumps
- C. Stop one charging pump, one SI pump, and both RHR pumps
- D. Stop both RHR pumps, leave all charging pumps and both SI pumps running

Proposed Answer: B

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Explanation (Optional):

- A. Incorrect. Would not stop both charging pumps as one will be aligned for normal charging
- B. Correct.
- C. Incorrect. This is a flow reduction that could be performed in ES-1.2
- D. Incorrect. In some EOPs, pressure is checked and both RHR pumps are tripped. In this EOP, B is the correct sequence

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

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:
 WTSI 48211 WCNOG

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Question #63

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>1</u>	_____
Group #	<u>2</u>	_____
K/A #	<u>E03 EA1.2</u>	_____
Importance Rating	<u>3.7</u>	_____

Ability to operate and / or monitor the following as they apply to the (LOCA Cooldown and Depressurization) Operating behavior characteristics of the facility.

Proposed Question: Common 63

Given the following:

- A small break LOCA has occurred.
- The crew is in ES-1.2, Post LOCA Cooldown And Depressurization.
- The crew has determined that one Charging pump can be stopped.

Which ONE of the following explains what will happen to the value of RCS subcooling over the next 60 seconds when the selected charging pump is stopped?

- A. Rises because break flow remains constant while charging flow is rising from the operating charging pump. RCS pressure rises because pressurizer level is rising.
- B. Lowers because RCS pressure lowers in response to reduced ECCS flow. Stabilizes at a lower value when break flow equals ECCS flow.
- C. Remains the same. Flow from the running Charging pump rises, reaching a balance with break flow.
- D. Remains the same. RCS temperature rises in response to the reduced ECCS flow, but RCS pressure also rises.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Temperature is controlled by steam dump and is not expected to rise.
- B. Correct.
- C. Incorrect. Subcooling is reduced as a result of lower ECCS flow.

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D. Incorrect. Temperature does not rise, and subcooling is reduced due to change in pressure.

Technical Reference(s) ES-1.2 BD (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #64

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>E07 EK3.4</u>	
	Importance Rating	<u>3.3</u>	_____

Knowledge of the reasons for the following responses as they apply to the (Saturated Core Cooling) 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: Common 64

A Steam Generator Tube Rupture has occurred.

- Due to subsequent failures, the crew is performing the actions of ECA-3.2, SGTR With Loss of Reactor Coolant – Saturated Recovery Desired.
- A yellow condition on the Core Cooling CSF Status Tree is received due to high pressurizer level and low RVLIS level.
- The crew is considering transition to FR-C.3, response to Saturated Core Cooling.

Which ONE of the following describes the action that will be taken, and reason for the action?

- A. Do not perform FR-C.3 because the actions conflict with the actions being taken in ECA-3.2.
- B. Perform FR-C.3 because the actions of Functional Recovery Procedures take precedence over actions in ECA procedures.
- C. Do not perform FR-C.3 because the actions in ECA procedures take precedence over the actions of Functional Recovery Procedures.
- D. Perform FR-C.3 because the actions will mitigate the event and assist the actions being taken in ECA-3.2.

Proposed Answer: A

Explanation (Optional):

A. Correct.

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- B. Incorrect. Opposite effect
- C. Incorrect. Wrong procedure usage
- D. Incorrect. Wrong procedure

Technical Reference(s) FR-C.3 and BD (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #65

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u> </u>
	Group #	<u>2</u>	<u> </u>
	K/A #	<u>E08 EK1.3</u>	<u> </u>
	Importance Rating	<u>3.5</u>	<u> </u>

Knowledge of the operational implications of the following concepts as they apply to the (Pressurized Thermal Shock) Annunciators and conditions indicating signals, and remedial actions associated with the (Pressurized Thermal Shock).

Proposed Question: Common 65

Given the following:

- The operating crew initiated a manual SI due to a small break LOCA.
- Equipment failures resulted in a RED condition on the Integrity CSF Status Tree.
- RCS Cooldown rate was approximately 220 deg F per hour.
- RCS temperature is currently 240 degrees F.
- The crew completed FR-P.1, Response to Imminent Pressurized Thermal Shock Condition; a soak is in progress.

Which ONE (1) of the following actions is permitted?

- A. Start an SI Pump
- B. Energize PZR heaters
- C. Increase AFW flow to SGs
- D. Isolate SI Accumulators

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Could potentially increase pressure or cooldown rate
- B. Incorrect. Will increase pressure
- C. Incorrect. Will decrease RCS temperature
- D. Correct.

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

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:

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Question #66

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>G 2.1.24</u>	_____
	Importance Rating	<u>2.8</u>	_____

Ability to obtain and interpret station electrical and mechanical drawings.

Proposed Question: Common 66

Given drawings E-23EF05 and M-22EF02:

Determine which ONE (1) of the following conditions will cause valve EFHV51, ESW to Component Cooling Water Heat Exchanger Isolation Valve, to go OPEN?

- A. Load Sequencer Signal step number '1' causing contact between terminal points 8 and 9 to close.
- B. Safety Injection Signal energizes relay K616 causing the contact between terminal points 3 and 3T to close.
- C. Undervoltage on 4160V bus NB02 and subsequent isolation of ESW from SW causing ARF 'a' contact to close.
- D. Undervoltage on 4160V bus NB01 and subsequent isolation of ESW from SW causing ARF 'a' contact to close.

Proposed Answer: C

Explanation (Optional):

- E. Incorrect. Load shed number '0' will close the contact
- F. Incorrect. SI will cause a contact to close, but not between these two terminals
- G. Correct. ARF 'a' closes on opposite train UV
- H. Incorrect. Wrong train, ARF 'a' closes on opposite train UV

Technical Reference(s) E-23EF05 (Attach if not previously provided)
M-22EF02

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Proposed references to be provided to applicants during examination: E-23EF05, M-22EF02

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments: From the Equipment Operator Bank #015C060B07

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Question #67

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	_____
	Group #	1	_____
	K/A #	G2.1.30	_____
	Importance Rating	3.9	_____

Ability to locate and operate components, including local controls.

Proposed Question: Common 67

The control room was evacuated due to a fire.

Which ONE (1) of the following describes the equipment used to control Pressurizer pressure locally and/or from the Aux Shutdown Panel?

- A. Normal Spray; PZR variable heaters
- B. Normal Spray; PZR backup heaters
- C. Auxiliary Spray; PZR variable heaters
- D. Auxiliary Spray; PZR backup heaters

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. RCPs tripped prior to leaving control room, normal spray not available
- B. Incorrect. RCPs tripped
- C. Incorrect. Variable heaters will not have power. Not controlled from ASP
- D. Correct.

Technical Reference(s) OTO-ZZ-00001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None _____

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:
Byron 2000 WTSI 41848

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Question #68

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>3</u>	_____
Group #	<u>1</u>	_____
K/A #	<u>G2.1.29</u>	_____
Importance Rating	<u>3.4</u>	_____

Knowledge of how to conduct and verify valve lineups.

Proposed Question: Common 68

A locked valve was repositioned Open during the previous shift.

During shift turnover the off going EO informs you he has doubt whether the valve was returned to the locked closed position. When approaching the room where the valve is located, it is evident fluid is flowing through the line downstream of the supposed locked closed valve.

Which ONE (1) of the following describes the method for verifying whether this valve is actually 'Locked Closed'?

- A. Visually verify that the stem is in the down position, then check the lock and chain are installed properly.
- B. Unlock the valve, using reasonable force, turn the valve in the close direction. Re-install the lock and chain.
- C. Check the lock and chain are installed properly, using reasonable force, turn the valve in the close direction.
- D. Unlock the valve, using reasonable force, turn the valve slightly in the open direction and then reclose the valve. Reinstall the lock and chain.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Would not be verifying closed. Some valve stems appear to have the valve closed when they actually do not
- B. Correct.
- C. Incorrect. Must remove chain before attempting to move valve
- D. Incorrect. Do not move a locked closed valve in open direction. Plausible because a locked open valve would be moved in the closed direction

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Question #69

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	_____
	Group #	<u>1</u>	_____
	K/A #	<u>G2.1.20</u>	_____
	Importance Rating	<u>4.3</u>	_____

Ability to execute procedure steps.

Proposed Question: Common 69

Given the following:

- The plant has tripped.
- A LOCA is in progress.
- The crew has transitioned from E-1, Loss of Reactor or Secondary Coolant, to FR-C.1, Response to Inadequate Core Cooling.

Which ONE (1) of the following describes the application of E-1 Foldout page items during this event?

- A. NOT applicable during the performance of FR-C.1.
- B. Remain applicable unless they conflict with action contained in FR-C.1.
- C. Remain applicable unless entry to E-2 or E-3 series procedures are made.
- D. No longer applicable after FR-C.1 actions have been completed and transition back to E-1 is made.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Similar to another practice of not undoing action performed in an FR
- C. Incorrect. Typically true, but with FR performance, they are not applicable either
- D. Incorrect. They will apply as long as they do not conflict with FR-C.1

Technical Reference(s) EOP/OTO Users Guide, ODP-ZZ-00025 (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10

Comments:
WCNOC 2003

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Question #70

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>G2.2.22</u>	_____
	Importance Rating	<u>3.4</u>	_____

Knowledge limiting conditions for operations and safety limits.

Proposed Question: Common 70

During hydrostatic testing of the RCS in Mode 5, RCS pressure is increased to a point exceeding the RCS Pressure Safety Limit.

Which ONE (1) of the following states the RCS Pressure Safety limit setpoint, and the MAXIMUM time allowed in accordance with Technical Specifications to reduce RCS pressure below the safety limit?

- A. 2735 PSIG; 5 minutes
- B. 2735 PSIG; 60 minutes
- C. 2750 PSIG; 5 minutes
- D. 2750 PSIG; 60 minutes

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Modes 1-3 time limit is 60 minutes
- C. Incorrect. PSIA instead of PSIG
- D. Incorrect. Wrong units and time

Technical Reference(s) TS 2.1.2 _____ (Attach if not previously provided)

Proposed references to be provided to applicants during examination: _____ None _____

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10
55.43 1

Comments:
WTSI generic

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Question #71

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	_____
	Group #	<u>2</u>	_____
	K/A #	<u>G2.2.30</u>	_____
	Importance Rating	<u>3.5</u>	_____

Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.

Proposed Question: Common 71

Given the following:

- The plant is in Mode 6.
- Refueling operations are in progress.
- A fuel assembly is being loaded into the core.

Which ONE (1) of the following would require fuel loading operations to be stopped immediately?

- A. An unanticipated rise in count rate by a factor of 1.5 occurs on any responding Source Range channel during any single loading step.
- B. Communications is lost between Containment and the Control Room.
- C. One Source Range is reading 5 CPS while the other is reading 3 CPS.
- D. Boron concentration drops by 10 ppm.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. SR counts would be evaluated
- B. Correct.
- C. Incorrect. This is normal expected SR CPS.
- D. Incorrect. As long as boron is within requirements, it is OK

Technical Reference(s) ETP-ZZ-00035 (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10
55.43 7

Comments:

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Question #72

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	<u>3</u>	<u> </u>
Group #	<u>3</u>	<u> </u>
K/A #	<u>G2.3.11</u>	<u> </u>
Importance Rating	<u>2.7</u>	<u> </u>

Ability to control radiation releases.

Proposed Question: Common 72

Given the following conditions:

- A rapid load reduction from 100% power to 65% power was performed approximately 3 hours ago.
- Chemistry confirms RCS activity exceeds Technical Specification limits.
- The CRS directs a plant shutdown be performed.

Which ONE (1) of the following describes the action subsequently performed to limit the release of radioactivity?

- A. Letdown is isolated.
- B. Maximum condensate polishers are placed in service.
- C. Letdown flow is maximized through the CVCS Mixed Bed Demineralizer.
- D. RCS is cooled down below 500 degrees F within 1 hour.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Would hinder decontamination to isolate letdown
- B. Incorrect. Do not increase flow on secondary side demins
- C. Correct. Increases removal of contaminants to decrease radioactivity levels.
- D. Incorrect. Cooldown will be performed IAW tech specs, but 1 hour not required. New TS removed requirement for cooldown below 500

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Question #73

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	_____
	Group #	<u>3</u>	_____
	K/A #	<u>G2.3.9</u>	_____
	Importance Rating	<u>2.5</u>	_____

Knowledge of the process for performing a containment purge.
 Proposed Question: Common 73

The plant is in Mode 5.

A Containment Purge is planned.

Which ONE (1) of the following describes the action taken to prevent backflow of containment atmosphere to other buildings?

- A. Any flow path established between containment and the Auxiliary Building via the air intake plenum should be established prior to starting SGT01, CTMT S/D PURGE AIR SUPPLY UNIT.
- B. Any flow path established between containment and the Auxiliary Building via the air intake plenum should be established prior to starting CGT01, CTMT S/D PURGE EXH FAN.
- C. SGT01, CTMT S/D PURGE AIR SUPPLY UNIT, should be running prior to establishing a flowpath between containment and the Auxiliary Building via the air intake plenum.
- D. CGT01, CTMT S/D PURGE EXH FAN, should be running prior to establishing a flowpath between containment and the Auxiliary Building via the air intake plenum, ONLY if the equipment hatch is open.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Should not establish a flowpath until air is being forced into containment
- B. Incorrect. Similar to a caution with equipment hatch open
- C. Correct. Purge supply running will ensure that air is not flowing out of CTMT
- D. Incorrect. Similar to another caution.

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Question #74

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	_____
	Group #	<u>4</u>	_____
	K/A #	<u>G2.4.34</u>	_____
	Importance Rating	<u>3.8</u>	_____

Knowledge of RO tasks performed outside the main control room during emergency operations including system geography and system implications.

Proposed Question: Common 74

Which ONE (1) of the following describes the operation of DG NE02 during a Control Room Evacuation in accordance with OTO-ZZ-00001, Control Room Inaccessibility?

- A. Disabled and prevented from automatically starting in the “B” Diesel Generator Room.
- B. Left in Standby and allowed to start automatically if required.
- C. Started from the Control Room prior to evacuation.
- D. Started by opening NB02 normal and alternate feeder breakers in the South Switchgear Room.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Train A will not be operating. Train B is protected
- B. Incorrect. EDG is started
- C. Incorrect. Not started in control room
- D. Correct.

Technical Reference(s) OTO-ZZ-00001 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

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Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 5

Comments:

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Question #75

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	_____
	Group #	4	_____
	K/A #	G2.4.2	_____
	Importance Rating	3.9	_____

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

Proposed Question: Common 75

The plant is at 8% power during a power increase.

Which ONE (1) of the following conditions will require entry to E-0, Reactor Trip or Safety Injection?

- A. Pressurizer Level exceeds 92%
- B. Pressurizer Pressure exceeds 2385 psig
- C. One Reactor Coolant Pump trips
- D. All turbine governor and stop valves close

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. PZR level trip is not active below 10% power (P-7)
- B. Correct. Always active
- C. Incorrect. Inactive below P-8
- D. Incorrect. Inactive below P-9

Technical Reference(s) E-0 Entry Conditions (Attach if not previously provided)

RPS LP

Proposed references to be provided to applicants during examination: None

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Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 7

Comments:

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Question #76

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>1</u>
Group #	_____	<u>1</u>
K/A #	<u>008 AA2.24</u>	
Importance Rating	_____	<u>2.6</u>

Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Value at which turbine bypass valve maintains header pressure after a reactor trip

Proposed Question: SRO 76

Given the following:

- A reactor trip and safety injection have occurred.
- The crew is performing actions of E-0, Reactor Trip or Safety Injection.
- All required actions have been taken.
- RCS pressure is 1250 psig.
- Pressurizer level is off-scale high.
- AFW flow is 400,000 lbm/hr.
- Containment pressure is 5 psig and rising.

Which ONE (1) of the following describes (1) how SG pressure is being controlled, (2) procedurally what temperature is being maintained and (3) the procedure that will be performed upon exit from E-0?

- A. (1) Condenser Steam Dumps; (2) maintaining Tave at 557 degrees F; (3) ES-1.1, SI Termination
- B. (1) Condenser Steam Dumps; (2) maintaining Tcold at 557 degrees F; (3) E-1, Loss of Reactor or Secondary Coolant
- C. (1) Atmospheric Steam Dumps; (2) maintaining Tave at 561 degrees F; (3) ES-1.1, SI Termination
- D. (1) Atmospheric Steam Dumps; (2) maintaining Tcold at 561 degrees F; (3) E-1, Loss of Reactor or Secondary Coolant

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Question #77

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>1</u>
Group #	_____	<u>1</u>
K/A #	<u>027 G2.1.2</u>	
Importance Rating	_____	<u>4.0</u>

Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.

Proposed Question: SRO 77

Given the following plant conditions:

- The plant is operating at 100% power.
- PZR PORV 455C lifts for no apparent cause
- The RO places the PORV Control Switch in CLOSE.
- PZR Pressure continues to go down with **Red and Green** indication for the PORV.
- The RO closes the associated block valve and PZR Pressure stops going down and is now at 2110 psig and increasing slowly.

Which ONE (1) of the following describes the MINIMUM required actions in accordance with Technical Specifications?

- A. Maintain power available to associated block valve; and restore RCS pressure to > limits specified in the COLR within a maximum of 2 hours.
- B. Maintain power available to associated block valve; and restore RCS pressure to > limits specified in the COLR within a maximum of 1 hour.
- C. Remove power from the associated block valve within one hour; restore RCS pressure to > limits specified in the COLR within a maximum of 1 hour.
- D. Remove power from associated block valve within one hour; restore RCS pressure to > limits specified in the COLR within a maximum of 2 hours.

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Proposed Answer: D

Explanation (Optional):

D is correct.

A is incorrect. Power would not be maintained because unable to cycle the leaking PORV. Credible because conditions could exist that would allow power to be maintained, and applicant must interpret indication to make that decision. Time for restoring pressure is correct

B is incorrect. Power would not be maintained because unable to cycle the leaking PORV. Credible because conditions could exist that would allow power to be maintained, and applicant must interpret indication to make that decision

C is incorrect. Credible because action to remove power is correct, and time for restoring pressure is incorrect

Technical Reference(s):	TS 3.4.1 and 3.4.11	(Attach if not previously provided)
	COLR	

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History:	Last NRC Exam	VC Summer 2006 Retake
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Question Cognitive Level:	Memory or Fundamental Knowledge	
	Comprehension or Analysis	X

10 CFR Part 55 Content:	55.41	
	55.43	2,5

Comments:

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Question #78

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>1</u>
Group #	_____	<u>1</u>
K/A #	<u>038 G2.4.4</u>	
Importance Rating	_____	<u>4.3</u>

Emergency Procedures / Plan Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Proposed Question: SRO 78

Given the following:

- A Steam Generator Tube Rupture has occurred.
- The reactor is tripped.
- Safety Injection is actuated.
- The crew is performing actions of E-3, Steam Generator Tube Rupture.
- After depressurizing the RCS to refill the pressurizer using a PZR PORV, the following conditions exist:
 - RCS pressure 700 psig and trending down slowly.
 - Ruptured SG pressure 700 psig and trending down slowly.
 - PORVs and Block Valves are closed.
 - RCS temperature is 480 degrees F.

Which ONE of the following procedures will be used to perform the remainder of the RCS and ruptured SG cooldown?

- A. ECA-3.1, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired
- B. ES-3.1, Post-SGTR Cooldown Using Backfill
- C. ES-3.2, Post-SGTR Cooldown Using Blowdown
- D. ES-3.3, Post-SGTR Cooldown Using Steam Dump

Proposed Answer: A

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Question #79

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>1</u>
	K/A #	<u>040 G2.4.31</u>	
	Importance Rating	_____	<u>3.4</u>

Emergency Procedures / Plan Knowledge of annunciators alarms and indications, and use of the response instructions.

Proposed Question: SRO 79

Given the following plant conditions:

- A transient has occurred from 100% power resulting in the following alarms:
 - PR OVER PWR ROD STOP
 - OTΔT ROD STOP
 - Reactor power indicates the following:
 - N41 – 101.8% and stable
 - N42 – 102.7% and stable
 - N43 – 102.9% and stable
 - N44 – 103.2% and stable
 - Tavg is 3 degrees F below Tref

Which ONE (1) of the following has occurred, and which action(s)/procedure(s) is/are required?

- A. Inadvertent dilution; initiate RCS boration to restore the plant to its previous condition in accordance with the alarm response and/or OTO-ZZ-00003, Loss of Shutdown Margin.
- B. Inadvertent dilution; reduce turbine load to reduce reactor power condition in accordance with the alarm response and/or OTO-ZZ-00003, Loss of Shutdown Margin.
- C. Steam Leak; reduce turbine load to reduce reactor power in accordance with the alarm response and/or OTO-ZZ-00008, Steam/Feedwater Line

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Question #80

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>1</u>
Group #	_____	<u>1</u>
K/A #	<u>058 AA2.01</u>	
Importance Rating	_____	<u>4.1</u>

Ability to determine and interpret the following as they apply to the Loss of DC Power: That a loss of dc power has occurred; verification that substitute power sources have come on line

Proposed Question: SRO 80

The plant is operating in Mode 1 in a normal electrical lineup:

The following annunciators are received:

- NK01 TROUBLE
- DC Bus NK01 voltage indicates 125 volts and decreasing slowly

Which ONE (1) of the following describes the status of the DC Bus and the action that will be required?

- A. Battery Charger NK21 has failed. Battery NK11 is supplying DC Bus NK01, however, the DC Bus is inoperable due to low voltage, and the Battery Charger NK25 must be placed in service.
- B. Battery Charger NK21 has failed. Battery NK11 is supplying DC Bus NK01 and maintaining the Bus OPERABLE. The Battery Charger NK25 must be placed in service.
- C. Battery NK11 output breaker has tripped. Determine corrective actions for Battery failure in accordance with the applicable Alarm Response Procedures. The bus remains operable as long as it is connected to the Battery Charger and voltage is maintained > Technical Specification requirements.
- D. Battery NK11 output breaker has tripped. Determine corrective actions for Battery failure in accordance with the applicable Alarm Response Procedures. The bus is returned to operable status only when the Battery Charger, Battery, and DC Bus voltage is restored to > Technical Specification requirements.

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Question #81

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>1</u>
	K/A #	<u>E05 EA2.2</u>	
	Importance Rating	_____	<u>4.3</u>

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 facility's license and amendments

Proposed Question: SRO 81

Given the following:

- FR-H.1, Loss of Secondary Heat Sink, is in progress.
- RCS Bleed and Feed was NOT initiated.
- Core exit TCs are stable.
- Containment pressure is 4.2 psig.
- AFW flow has just been established at 400,000 lbm/hr.
- SG levels are as follows:
 - 'A' 43% wide range and rising
 - 'B' 42% wide range and stable
 - 'C' 29% wide range and lowering
 - 'D' 37% wide range and rising

Which ONE (1) of the following is required in accordance with FR-H.1?

- A. Return to procedure and step in effect.
- B. Remain in FR-H.1 and immediately initiate RCS bleed and feed.
- C. Remain in FR-H.1 until at least 1 SG narrow range level is greater than the minimum required.
- D. Remain in FR-H.1 until all SG narrow range levels are greater than the minimum required.

Proposed Answer: A

Explanation (Optional):

A. Correct.

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Question #82

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>2</u>
	K/A #	<u>001 G2.1.23</u>	
	Importance Rating	_____	<u>4.0</u>

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Proposed Question: SRO 82

Given the following plant conditions:

- The plant is at 50% power.
- ALL controls are in automatic
- An event occurs resulting in the following indications:
 - RCS T_{avg} rising approximately 5°F above T_{ref} .
 - Reactor Power is rising.
 - First Stage Pressure Transmitter ACPT0505 (Selected) indicates 330 psig and stable.
 - First Stage Pressure Transmitter ACPT0506 indicates 800 psig.
 - Control Bank D is withdrawing at 16 steps per minute.

Which ONE (1) of the following describes the procedure entry required to mitigate the event and the reason for the procedural actions taken?

- A. OTO-AC-00003, Turbine Impulse Pressure Channel Failure; to minimize the impact on power distribution limits.
- B. OTO-AC-00003, Turbine Impulse Pressure Channel Failure; to prevent an out of spec negative Axial Flux Difference.
- C. OTO-SF-00001, Rod Control Malfunctions; to minimize the impact on power distribution limits.
- D. OTO-SF-00001, Rod Control Malfunctions; to prevent an out of spec QPTR.

Proposed Answer: C

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Question #83

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>1</u>
Group #	_____	<u>2</u>
K/A #	<u>005 AA2.04</u>	
Importance Rating	_____	<u>3.4</u>

Ability to determine and interpret the following as they apply to the Inoperable / Stuck Control Rod: Interpretation of computer in-core TC map for dropped rod location

Proposed Question: SRO 83

Given the following:

- The plant is at 100% power.
- While withdrawing Control Bank D rods to maintain Tave, ONE (1) Group 2 rod decouples from its drive shaft and drops to the bottom of the core.

Which ONE (1) of the following describes how the dropped rod may be identified, the effect on the plant, and action required if the condition continues to exist?

- AFD will be more positive for the NI in the area of the dropped rod. Radial flux distribution will not exceed design limits. If QPTR limits are exceeded, reactor power must be reduced.
- AFD will be more negative for the NI in the area of the dropped rod. Axial flux distribution may exceed design limits. If AFD limits are exceeded, Mode 3 entry is required.
- In-core flux mapping will determine the area of the dropped rod. Radial flux distribution may exceed design limits. If QPTR limits are exceeded, reactor power must be reduced.
- In-core flux mapping will determine the area of the dropped rod. Axial flux distribution will not exceed design limits. If QPTR limits are exceeded, Mode 3 entry is required.

Proposed Answer: C

Explanation (Optional):

C is correct. A single misaligned rod will create radial power distribution problems, resulting in QPTR problems. AFD problems are associated with control rod bank alignment. If QPTR is exceeding limits, then power must be

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Question #84

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>2</u>
	K/A #	<u>E03 EA2.1</u>	
	Importance Rating	_____	<u>4.2</u>

Ability to determine and interpret the following as they apply to the (LOCA Cooldown and Depressurization) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Proposed Question: SRO 84

Given the following conditions:

- A LOCA has occurred
- The crew is performing E-1, Loss of Reactor or Secondary Coolant
- The following parameters exist:
 - All SG pressures – 900 psig and slowly trending down
 - All SG levels – being controlled at 40% NR
 - PZR level – off-scale low
 - RVLIS PUMPS OFF indication is 20%
 - Containment Pressure – 23 psig
 - RWST level – 69% and decreasing slowly
 - RCS pressure – 750 psig and decreasing slowly

Based on these indications, which ONE (1) of the following procedures will the crew enter next?

- A. ES-1.1, SI Termination
- B. ES-1.2, Post LOCA Cooldown and Depressurization
- C. ES-1.3, Transfer to Cold Leg Recirculation
- D. E-2, Faulted Steam Generator Isolation

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Criteria not met due to PZR level
- B. Correct.

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Question #85

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>1</u>
Group #	_____	<u>2</u>
K/A #	<u>E06 G2.4.6</u>	
Importance Rating	_____	<u>4.0</u>

Emergency Procedures/Plan: Knowledge of symptom based EOP mitigation strategies

Proposed Question: SRO 85

Given the following:

- A LOCA has occurred.
- RCPs are tripped.
- Core Exit Thermocouples indicate approximately 650 degrees F.
- RVLIS PUMPS OFF indicates 30%.
- Containment pressure peaked at 10 psig.

Which ONE of the following describes the procedure required for this event, and also describes the required operation of PZR PORVs for the event?

- A. Enter FR-C.1, Response to Inadequate Core Cooling; Leave PORVs closed and ISOLATED to prevent further loss of RCS inventory.
- B. Enter FR-C.1, Response to Inadequate Core Cooling; Allow PORVs to operate as required in AUTO to limit RCS pressure excursions.
- C. Enter FR-C.2, Response to Degraded Core Cooling; Leave PORVs closed and ISOLATED to prevent further loss of RCS inventory.
- D. Enter FR-C.2, Response to Degraded Core Cooling; Allow PORVs to operate as required in AUTO to limit RCS pressure excursions.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Wrong procedure, conditions are orange path
- B. Incorrect. Wrong procedure but correct operation of PORV
- C. Incorrect. Correct procedure but incorrect use of PORVs

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D. Correct. KA is matched because the PORV offers protection against the RCS Pressure safety limit being exceeded

Technical Reference(s) CSF-1, FR-C.2 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comments:
Have others similar but this is a new question with the combination of procedure entry and PORV operation

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Question #86

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>005 A2.03</u>	
	Importance Rating	_____	<u>3.1</u>

Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR Pump/motor malfunction

Proposed Question: SRO 86

Given the following:

- The plant is in Mode 5.
- RHR Train “A” is in service.
- RCS Drain down is commencing.
- Pressurizer level is currently 5% and lowering.
- Subsequently, RHR Pump ‘A’ discharge pressure and flow are lowering.
- Operator observes a reduction in RHR Pump current to 20 amps.

Which ONE of the following is occurring, and which procedure will be used to mitigate the event?

- A. RHR Pump cavitation; OTO-EJ-00001, Loss of RHR flow.
- B. RHR Pump failure; OTO-EJ-00001, Loss of RHR flow.
- C. RHR Pump failure; OTO-EJ-00003, Loss of RHR While Operating at Reduced Inventory or Mid-Loop.
- D. RHR Pump cavitation; OTO-EJ-00003, Loss of RHR While Operating at Reduced Inventory or Mid-Loop.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Wrong failure, correct procedure
- B. Correct. Degraded head on pump. Enter EJ-00001 because cavitation not likely

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Question #87 Changed on Post Exam comments (see report 2007/301 for details)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>006 A2.10</u>	_____
	Importance Rating	_____	<u>3.9</u>

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 is SIS

Proposed Question: SRO 87

Chemistry sample has determined the following:

- "A" SI Accumulator boron concentration is 2306 ppm.
- "B" SI Accumulator boron concentration is 2292 ppm.
- "C" SI Accumulator boron concentration is 2307 ppm.
- "D" SI Accumulator boron concentration is 2299 ppm.
- RWST boron concentration is 2358 ppm.

Which ONE (1) of the following describes the impact of this condition in accordance with technical specifications?

- A. RWST operability status may not be adequate to counteract the reactivity effects of an uncontrolled RCS cooldown. Comply with the actions of TS 3.5.4 to restore RWST boron concentration or initiate a plant shutdown to Hot Standby.
- B. RWST operability status may adversely affect the assumptions made for transfer to Hot Leg Recirculation following a LOCA. Comply with the actions of TS 3.0.3 and initiate action to restore RWST operability.
- C. SI Accumulator operability may not meet the requirements of ECCS acceptance criteria for maintenance of a coolable core geometry. Comply with the actions of TS 3.5.1 to restore SI Accumulator operability or initiate a plant shutdown to Hot Standby.
- D. SI Accumulator operability may not meet the requirements to assure subcriticality in a post-LOCA environment. Comply with the actions of TS 3.0.3 and initiate action to restore SI accumulator operability.

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Proposed Answer: D and C (TS 3.5.1 indicates to implement 3.0.3 when 2 SI Accum OOS)

Explanation (Optional): so implementing TS 3.5.1 will implement 3.0.3)

- A. Incorrect. RWST remains operable, but if it was not, these actions would be correct
- B. Incorrect. RWST remains operable, 3.0.3 would not be required if only the RWST was OOS
- C. Incorrect. TS 3.5.1 applies but 3.0.3 takes precedence because 2 SI accumulators are OOS
- D. Correct.

Technical Reference(s) TS 3.5.1, TS 3.0.3 (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: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 _____
55.43 2, 5 _____

Comments:

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Question #88

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>012 G2.4.50</u>	_____
	Importance Rating	_____	<u>3.3</u>

Emergency Procedures / Plan Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Proposed Question: SRO 88

Given the following:

- The plant is at 100% power.
- SSPS testing is in progress on Train "A".
- The following alarm is received:
 - SSPS Train A General Warning
- The RO acknowledges the alarm as expected.
- The alarm is currently locked in.
- Subsequently, the following alarm is received:
 - SSPS Train B General Warning
- The RO acknowledges the alarm.
- NO other alarms are present.

Which ONE (1) of the following describes the status of the alarm, and the action required?

- A. The alarm is expected due to the cross-train logic testing for Reactor Trip and Bypass breakers. Refer to the alarm response to ensure no unexpected conditions exist.
- B. The alarm is expected due to the cross-train logic testing for Reactor Trip and Bypass breakers. Refer to TS 3.3.1, RPS Instrumentation, for action required related to the testing.
- C. The alarm is unexpected for SSPS testing. Enter TS 3.0.3. Suspend the testing and return Train A to OPERABLE due to two SSPS trains

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Question #89

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>062 G2.2.25</u>	
	Importance Rating	_____	<u>3.7</u>

Equipment Control Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.
 Proposed Question: SRO 89

Given the following:

- A loss of off-site power has occurred.
- EDG NE02 has tripped on overspeed.
- The crew is performing actions of E-0, Reactor Trip or Safety Injection.

In accordance with Safety Analysis assumptions, which ONE (1) of the following describes whether the design basis of the AC distribution system is met, and the reason why?

- A. Design basis is met; one train of safeguards equipment remains available for accident mitigation.
- B. Design basis is met; 120 vac and 125 vdc instrumentation remains available for plant control and monitoring.
- C. Design basis is NOT met; EITHER both off-site supplies OR both on-site supplies are required to meet safety analysis assumptions.
- D. Design basis is NOT met; failure of NE02 makes 120 vac instrument busses inoperable, resulting in failures beyond that assumed for worst case.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Basis for Mode 5 operability of AC sources
- C. Incorrect. Design basis is met. Second half of option is a twist on what may be lost, in conjunction with a worst case failure
- D. Incorrect. Design basis is met, option cascades failure, but it is confined to 1 train

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Question #90

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>064 G2.1.2</u>	
	Importance Rating	_____	<u>4.0</u>

Knowledge of operator responsibilities during all modes of plant operation

Proposed Question: SRO 90

Given the following:

- The plant is in Mode 4
- A plant heatup is in progress
- Normal Off-site power is available/supplying all AC buses.
- An EO reports that there is a big pool of oil under EDG "B"
- Further investigation reveals that an oil discharge coupling has gross leakage and that EDG "B" should not be operated until the leak is fixed.

Which ONE (1) of the following specifies the correct action with regards to Technical Specifications?

- A. Return EDG "B" to operable status within 1 hour or be in Mode 5 in 24 hours.
- B. Verify EDG "A" operability (starts, achieves rated volt/freq) within one hour.
- C. Verify off-site power lineup/availability within one hour.
- D. Immediately initiate action to place the plant in Mode 5 within 6 hours.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Action statement refers to redundant features in this manner
- B. Incorrect. Would not perform operability test of other EDG if common cause was not the concern
- C. Correct.
- D. Incorrect. Would not immediately perform cooldown to Mode 5

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Question #91

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>002 G2.1.14</u>	
	Importance Rating	_____	<u>3.3</u>

Conduct of Operations: Knowledge of system status criteria which require the notification of plant personnel.

Proposed Question: SRO 91

Which ONE (1) of the following describes an event that requires notification to the Emergency Duty Officer but does NOT require contacting the NRC, in accordance with ODP-ZZ-00001, Addendum 13, Shift Manager Communications to Emergency Duty Officer? (Consider each event separately)

- A. An unplanned load reduction of 30% due a Feedwater Pump failure.
- B. A Chemist receives unplanned radiation exposure and contamination while sampling the RCS.
- C. Unplanned entry into OTO-BB-00005, High RCS Activity.
- D. Tornado warning issued for Callaway County.

Proposed Answer: C.

Explanation (Optional):

- A. Incorrect. >15% requires notification of NRC
- B. Incorrect. Unplanned exposure requires NRC notification
- C. Correct. Unplanned entry to an OTO, by itself, does not require NRC notification
- D. Incorrect. Tornado warning requires NRC notification

Technical Reference(s) ODP-ZZ-00001, ADD 13 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 10
55.43 5

Comments:

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Question #92

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>015 G2.2.2</u>	
	Importance Rating	_____	<u>4.1</u>

Equipment Control: Knowledge of limiting conditions for operations and safety limits.

Proposed Question: SRO 92

Given the following conditions:

- A reactor startup is in progress.
- Both Intermediate Range channels indicate approximately $5 \text{ E } -11$ amps.
- Source Range Channel N-31 fails DOWNSCALE.

Which ONE (1) of the following describes the required operator response and the reason for the response?

- A. Continue the reactor startup; with only one source range channel operable, 48 hours is allowed to restore two channels to service.
- B. Suspend the reactor startup; source range channels are not required to trip the reactor; however, the source range monitoring functions must be available.
- C. Continue the reactor startup; the Intermediate Range Neutron Flux Trip and the Power Range Neutron Flux-Low Trip provide the necessary core protection.
- D. Suspend the reactor startup; with only one source range channel operable, the minimum required Source Range High Flux Trip protection is not met.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Source Range is required in this condition. Would be correct if startup was not in progress
- B. Incorrect. Source Range trip is required.

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Question #93

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>034 K1.04</u>	_____
	Importance Rating	_____	<u>3.5</u>

Knowledge of the physical connections and/or cause-effect relationships between the Fuel Handling System and the following systems: NIS

Proposed Question: SRO 93

Given the following:

- The plant is in Mode 6.
- Core Alterations are in progress.
- A loss of Vital Instrument Bus NN01 occurs.

In accordance with Technical Specifications, which ONE (1) of the following describes the action required with respect to Core Alterations?

- A. Immediately suspend Core Alterations and any evolution that would dilute RCS boron concentration to below TS requirements.
- B. Core Alterations or evolutions that would dilute RCS boron concentration may continue if the Source Range Audio Count Rate is selected to an operable channel.
- C. Core Alterations may continue. Any evolution that would dilute RCS boron concentration to below TS requirements is prohibited.
- D. Immediately suspend Core Alterations. Ensure at least one (1) Source Range NI is operable prior to continuing with any plant evolution.

Proposed Answer: A

Explanation (Optional):

- A. Correct. IAW TS 3.9.3
- B. Incorrect. SR Audio count rate must be selected to N-32, but core alterations must stop

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Question #94

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>3</u>
Group #	_____	<u>1</u>
K/A #	<u>G2.1.32</u>	_____
Importance Rating	_____	<u>3.8</u>

Ability to explain and apply all system limits and precautions.

Proposed Question: SRO 94

Given the following plant conditions:

- A LOCA has occurred and the following containment conditions exist upon transition from E-0:
 - Containment Pressure is 26 psig and rising.
 - Containment Normal Sump level is 156 inches and rising.
 - Containment Radiation level is 18 Rem per hour.

Which ONE (1) of the following describes the impact on the unit and which ONE (1) of the following procedures will be used to mitigate the event?

- A. Containment Pressure is rising to a level that post-accident integrity could be threatened. Transition to FR-Z.1, Response to High Containment Pressure.
- B. Containment Sump is rising to a level that the operation of critical components may be affected. Transition to FR-Z.2, Response to Containment Flooding.
- C. Containment Radiation level requires transition to FR-Z.3, Response to High Containment Radiation, to ensure proper ventilation alignment to minimize potential for off-site release.
- D. All Containment Critical Safety Function conditions are YELLOW. Go to E-1, Loss of Reactor or Secondary Coolant.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. 27 psig if less than 2 spray pumps running require entry to FR-Z.1

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- B. Correct.
- C. Incorrect. Radiation does meet yellow path limit, but orange on flooding takes priority
- D. Incorrect. E-1 would be correct if no orange path existed.

Technical Reference(s) CSF-1 Containment (Fig. 5) (Attach if not previously provided)
BD-CSF-1 Fig 5, Dec 4

Proposed references to be provided to applicants during examination: None

Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 _____
55.43 5

Comments:
WTSI Generic

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Question #95

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>3</u>
Group #	_____	<u>1</u>
K/A #	<u>G2.1.5</u>	_____
Importance Rating	_____	<u>3.4</u>

Ability to locate and use procedures and directives related to shift staffing and activities.

Proposed Question: SRO 95

Given the following:

- The plant is in Mode 1.
- The shift is manned to the Technical Specification minimum composition.
- The shift has 4 hours remaining.
- The RO has become ill and must leave the site for emergency medical treatment.

Which ONE (1) of the following describes the requirements regarding the shift composition and the MINIMUM required action in this situation?

- A. Responsibilities of the RO may be turned over to the BOP for the remainder of the shift.
- B. The RO may leave the site immediately after turnover of responsibilities to another qualified person on shift. A replacement must arrive within 1 hour.
- C. The RO may leave the site immediately after turnover of responsibilities to another qualified person on shift. A replacement must arrive within 2 hours.
- D. The RO may not leave until relieved by another qualified RO.

Proposed Answer: C

Explanation (Optional):

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Question #96

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>2</u>
	K/A #	<u>G2.2.9</u>	_____
	Importance Rating	_____	<u>3.3</u>

Knowledge of the process for determining if the proposed change, test or experiment increases the probability of occurrence or consequences of an accident during the change, test or experiment.

Proposed Question: SRO 96

Given the following plant conditions:

- The plant is in Mode 3.
- Engineering has requested that the A SI pump be started with the discharge valve throttled to 75% open to determine starting current.
- The Operations Manager has determined that a Procedure change is required to support the outage critical path schedule.
- The test is NOT described in the current test procedure or the Final Safety Analysis Report (FSAR).

The Shift Manager may approve the test procedure change

_____.

- A. Without any restrictions.
- B. ONLY with concurrence from another licensed SRO.
- C. ONLY after licensing concurrence is obtained.
- D. ONLY after a written 10CFR50.59 safety evaluation has been approved.

Proposed Answer: D

Explanation (Optional):

A. Incorrect; Not described in FSAR, then the SM cannot approve by him(her)self.

B. Incorrect; 2 SROs can approve normal procedure changes.

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Question #97

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>2</u>
	K/A #	<u>G2.2.11</u>	_____
	Importance Rating	_____	<u>3.4</u>

Knowledge of the process for controlling temporary changes.

Proposed Question: SRO 97

Who, by title, is required to (1) authorize placement of a Temporary Modification, and (2) ensure quarterly review and audit of active Temporary Modifications, in accordance with APA-ZZ-00605, Temporary System Modifications?

- A. (1) Shift Manager
(2) Assistant Manager Shift Operations
- B. (1) Assistant Manager Shift Operations
(2) Shift Manager
- C. (1) Shift Manager
(2) Shift Manager
- D. (1) Assistant Manager Shift Operations
(2) Assistant Manager Shift Operations

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Opposite of actual authority
- C. Incorrect. AMSO ensures quarterly audits
- D. Correct. SM is required to approve

Technical Reference(s) APA-ZZ-000605 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

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Learning Objective: _____ (As available)

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

Question History: Last NRC Exam _____

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

10 CFR Part 55 Content: 55.41 _____
55.43 3

Comments:

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Question #98

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>3</u>
Group #	_____	<u>3</u>
K/A #	<u>G2.3.4</u>	_____
Importance Rating	_____	<u>3.1</u>

Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.

Proposed Question: SRO 98

Given the following plant conditions:

- A General Emergency exists.
- The TSC is manned and functional.
- A valve in the Aux Building must be closed to prevent damage to valuable safety related equipment.
- Radiation levels are extremely high.

Which ONE (1) of the following describes the maximum dose that is allowed to perform this operation and whose permission is required?

An individual may receive . . .

- A. Up to 10 Rem TEDE with permission from the duty Shift Manager.
- B. Up to 100 Rem TEDE with permission from the duty Shift Manager.
- C. Up to 10 Rem TEDE with permission from the Emergency Coordinator.
- D. Up to 100 Rem TEDE with permission from the Emergency Coordinator.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. With TSC manned, SM will not approve dose
- B. Incorrect. Wrong dose, wrong approval. Dose is for life-saving
- C. Correct.
- D. Incorrect. Wrong dose. Dose is for life-saving

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Question #99

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>4</u>
	K/A #	<u>G2.4.44</u>	_____
	Importance Rating	_____	<u>4.0</u>

Knowledge of emergency plan protective action recommendations.

Proposed Question: SRO 99

Which ONE (1) of the following describes the MINIMUM IMMEDIATE Protective Action Recommendation required when a General Emergency is declared?

- A. Evacuate a 2 mile radius and 5 miles downwind.
- B. Evacuate a 5 mile radius and 10 miles downwind.
- C. Shelter a 2 mile radius and 5 miles downwind.
- D. Shelter a 5 mile radius and 10 miles downwind.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. 10 miles may be a subsequent PAR.
- C. Incorrect. Evacuation required, not shelter
- D. Incorrect. Evacuation required, not shelter.

Technical Reference(s) EIP-ZZ-0212, section 5.1.1.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: NA (As available)

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

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Question #100

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	_____	<u>3</u>
Group #	_____	<u>4</u>
K/A #	<u>G2.4.6</u>	_____
Importance Rating	_____	<u>4.0</u>

Knowledge symptom based EOP mitigation strategies.

Proposed Question: SRO 100

The unit has tripped due to a LOCA and ESF equipment has failed to start.

FR-C.2, "Response to Degraded Core Cooling," has been entered.

A depressurization of the Steam Generators (SGs) is being performed in accordance with FR-C.2, when the STA reports that there is a Red Path on the Integrity CSF Status Tree.

Which ONE (1) of the following describes the actions that will be taken?

- A. Immediately transition to FR-P.1, "Response to Imminent Pressurized Thermal Shock Conditions"
- B. Stop the S/G depressurization and, if the red path does not clear, transition to FR-P.1, "Response to Imminent Pressurized Thermal Shock Conditions"
- C. Complete FR-C.2 and then transition to FR-P.1, "Response to Imminent Pressurized Thermal Shock Conditions," if the red path still exists
- D. Complete the S/G depressurization and then transition to EMG FR-P1, "Response to Imminent Pressurized Thermal Shock Conditions," if the red path still exists

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Action in FR-C.2 is causing this condition
- B. Incorrect. Continue depressurization because core cooling would be a priority in this case
- C. Correct. Because of the SG depressurization, a Red condition on Integrity is

