

ROBINSON EXAM 2002-301

JULY 26, 2002

FINAL SRO/RO WRITTEN EXAM

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	001K2.02	
	Importance Rating	3.6	3.7

Knowledge of electrical power supplies to the following: Control Rod Drive System; One-line diagram of power supply to trip breakers

Proposed Question: Common 1

Which ONE (1) of the following describes the correct electrical distribution flowpath to a Reactor Trip Breaker?

- A. 4KV bus 3, SST-2C, 480V bus 4, 'B' Rod Drive MG
- B. 4KV bus 1, SST-2B, 480V bus 2A, 'A' Rod Drive MG
- C. 4KV bus 3, SST-2G, 480V bus 3, 'B' Rod Drive MG
- D. 4KV bus 1, SST-2B, 480V bus 2B, 'A' Rod Drive MG

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. 480V bus 4 wrong. Opposite side bus
- B. Incorrect. Rod Drive MG A is off 480V bus 2B
- C. Incorrect. SST-2G wrong component. Opposite side transformer
- D. Correct

Technical Reference(s): VAC SD (Attach if not previously provided)

RDCNT SD

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	001A1.01	
	Importance Rating	3.8	4.2

Ability to predict and/or monitor changes in parameters associated with operating the Control Rod Drive System controls including:
T-ave. and no-load T-ave

Proposed Question: Common 2

A plant startup is in progress after a mid-cycle outage.

- The crew is performing GP-005, Power Operation.
- Reactor power is approximately 2%.
- Tav_g indicates 545°F. Main Steam Dumps are closed.
- The RO withdraws control rods to restore Tav_g to the normal control band.

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

- Tav_g will rise until steam dumps open. Tav_g will drop back to its original value.
- Tav_g will rise until steam dumps open. Tav_g will be maintained at a value consistent with the demand placed on the steam dumps.
- Steam dumps will open to maintain Tav_g at the current value.
- Steam dumps will open, causing Tav_g to drop to a value consistent with the increased steam demand.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Part of description of + MTC. Mid cycle cannot have + MTC
- Correct. Steam dump set for 547-551
- Incorrect. Part of description of + MTC. Mid cycle cannot have + MTC
- Incorrect. Part of description of + MTC. Mid cycle cannot have + MTC

Technical Reference(s): GP-005 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	003A3.03	
	Importance Rating	3.2	3.1

Ability to monitor automatic operations of the Reactor Coolant Pump System (RCPS) including: Seal D/P

Proposed Question: Common 3

Which ONE (1) of the following would be an indication of a failure of the #2 seal on a Reactor Coolant Pump?

- A. High seal return flow from #1 seal with High DP across #2 seal
- B. Low DP across #2 seal with low standpipe level
- C. Low seal return flow from #1 seal with high standpipe level
- D. Low DP across #1 seal with seal injection temperature rising

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. #1 seal problem
- B. Incorrect. Possible #3 seal problem
- C. Correct.
- D. Incorrect. #1 seal problem

Technical Reference(s): APP-001 C5 (Attach if not previously provided)

APP-001 E2

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	004K4.14	
	Importance Rating	2.8	3.2

Knowledge of Chemical and Volume Control System (CVCS) design feature(s) and or interlock(s) which provide for the following:
Control interlocks on letdown system (letdown tank bypass valve)

Proposed Question: Common 4

Given the following conditions:

- The plant is operating at 100% RTP.
- All equipment is in service.
- VCT level transmitter, LT-115, fails to zero.

Assuming no operator action, which ONE (1) of the following describes the plant response?

- LCV-115B will open and a continuous boration shuts down the plant.
- Continuous auto makeup occurs, VCT fills to diversion setpoint, LCV-115A diverts to CVCS Hold Up Tanks.
- Continuous auto makeup occurs, VCT fills and eventually will overpressurize.
- Letdown diverts to the CVCS Hold Up Tanks, auto makeup will NOT occur, VCT will empty.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Valve unaffected by failure
- Correct
- Incorrect. VCT fills and diverts to CVCS Hold Up Tanks
- Incorrect. 115 failed low, auto makeup will be occurring

Technical Reference(s): SD-021 (Attach if not previously provided)
AOP-003

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	004K6.17	
	Importance Rating	4.4	4.6

Knowledge of the effect of a loss or malfunction on the following will have on the Chemical and Volume Control System (CVCS):
Loss of boration flowpaths

Proposed Question: Common 5

An ATWS has occurred.

The crew is aligning the Charging System for emergency boration.

Both Boric Acid Pumps are tripped and cannot be started.

Which ONE (1) of the following suction flowpaths is unavailable due to the loss of Boric Acid Pumps?

- A. LCV-115B, Emergency Makeup to Charging Pump suction
- B. LCV-115C, VCT Outlet to Charging Pump suction
- C. MOV-350, Boric Acid to Charging Pump suction
- D. CVC-358, RWST to Charging Pump suction

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Alternate flowpath
- B. Incorrect. Isolated path if alternate chosen
- C. Correct.
- D. Incorrect. Local action for alternate path

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

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	013K1.06	
	Importance Rating	4.2	4.4

Knowledge of the physical connections and/or cause-effect relationships between Engineered Safety Features Actuation System (ESFAS) and the following: ECCS

Proposed Question: Common 6

A Large Break LOCA has occurred coincident with a Loss of Off-Site Power.

The 'A' EDG is under clearance for maintenance and unavailable.

Which ONE (1) of the following describes the operation of Engineered Safety Features?

- A. Two trains of SI equipment will start, while only one train is necessary for adequate core cooling.
- B. One train of SI equipment will start and maintain adequate core cooling.
- C. Two trains of Blackout equipment will start and both trains are necessary to maintain adequate core cooling.
- D. One train of Blackout equipment will start but both trains are necessary to maintain adequate core cooling.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Only 1 train starts
- B. Correct
- C. Incorrect. Safeguards will start
- D. Incorrect. Safeguards will start

Technical Reference(s): PATH –1 Basis Document (Attach if not previously provided)
ESF SD

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	013A2.04	
	Importance Rating	3.6	

Ability to (a) predict the impacts of the following on the Engineered Safety Features Actuation System (ESFAS) and (B) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Loss of instrument bus

Proposed Question: RO 7

A loss of Instrument Bus 2 has occurred.

The crew is performing actions contained in AOP-024, Loss of Instrument Bus, Attachment 3, Extended Loss of IB 2 & 7.

Subsequently, a reactor trip and Safety Injection actuation occur.

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

- A. Train 'A' ECCS components must be started manually.
- B. Train 'B' ECCS components must be started manually.
- C. Train 'A' and 'B' ECCS components must be started manually.
- D. Train 'A' and 'B' ECCS components will start automatically.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Wrong train
- C. Incorrect. Train B will start automatically
- D. Incorrect. Train A must be started manually

Technical Reference(s): ESF SD (Attach if not previously provided)
AOP 24

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	013A2.04	
	Importance Rating		4.2

Ability to (a) predict the impacts of the following on the Engineered Safety Features Actuation System (ESFAS) and (B) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Loss of instrument bus

Proposed Question: SRO 7

A loss of Instrument Bus 2 has occurred.

The crew is performing action contained in AOP-024, Loss of Instrument Bus, Attachment 3, Extended Loss of IB 2 & 7.

Subsequently, a reactor trip and Safety Injection actuation occur.

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

- A. Train 'A' ECCS components must be started manually IAW PATH-1.
- B. Train 'A' ECCS components must be started manually IAW AOP-024.
- C. Train 'B' ECCS components must be started manually IAW PATH-1.
- D. Train 'B' ECCS components must be started manually IAW AOP-024.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. AOP does not give guidance for operation of ECCS
- C. Incorrect. Wrong train
- D. Incorrect. Wrong train

Technical Reference(s): ESF SD (Attach if not previously provided)
AOP 24

PATH-1

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		2	2
Group #		1	1
K/A #		059A4.03	
Importance Rating		2.9	2.9

Ability to manually operate and/or monitor in the control room: Main Feedwater (MW) System; Feedwater control during power increase and decrease

Proposed Question: Common 8

Given the following conditions:

- A plant startup is in progress.
- Reactor power is 17%.
- The Main Generator is on-line.

Which ONE (1) of the following describes how feedwater control will be transferred to the Feedwater Regulating Valves (FRV)?

- Ensure the demand position of the FRV matches the demand position of the bypass valve. Place the FRV in automatic, and manually close the bypass valve.
- Manually open the FRV, ensuring the bypass valve throttles closed. When the bypass valve is closed and SG level is stable, place the FRV in auto.
- Close the bypass valve, place the FRV in auto, ensuring the FRV opens and SG level is maintained on program.
- Manually throttle open the FRV and simultaneously throttle the bypass valve in the closed direction. When SG level is trending to program, place the FRV in auto and slowly close the bypass valve.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Demand positions on the valves will not match for constant flow due to valve

sizing differences

- B. Incorrect. Bypass valve is manually operated
- C. Incorrect. Only place FRV in auto after it is controlling level
- D. Correct.

Technical Reference(s): GP-005 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	061A3.03	
	Importance Rating	3.9	3.9

Ability to monitor automatic operations of the Auxiliary / Emergency Feedwater (AFW) System including: AFW S/G level control on automatic start

Proposed Question: Common 9

Given the following conditions:

- The plant has experienced a trip from 100% RTP.
- All SG NR levels indicate 6%.

Which ONE (1) of the following describes the response of the AFW system upon initiation?

- The normally closed MDAFW pump discharge flow control valves (FCV-1424 and 1425) throttle as necessary to maintain 300 GPM AFW flow per pump.
- The normally closed SDAFW pump discharge flow control valve (FCV-6416) throttles open.
- The normally open MDAFW pump discharge flow control valves (FCV-1424 and FCV-1425) throttle closed.
- The normally open SDAFW pump discharge flow control valve (FCV-6416) throttles to maintain flow at 500 GPM.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Not setpoint
- Incorrect. Normally open
- Incorrect. Normally closed
- Correct

Technical Reference(s): AFW SD

(Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	068A2.02	
	Importance Rating	2.7	2.8

Ability to (a) predict the impacts of the following on the Liquid Radwaste System (LRS) and (B) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Lack of tank recirculation prior to release

Proposed Question: Common 10

A Batch Release of Waste Condensate Tank 'E' is scheduled.

The Waste Condensate Recirculation Pump is out of service.

Which ONE (1) of the following describes the necessary requirements to obtain a release permit for Waste Condensate Tank 'E'?

- A. A release permit may be issued if the tank was previously on recirculation for at least 30 minutes and satisfactory sample results obtained from E&RC.
- B. Recirculate for 1 hour using Waste Condensate Pump 'B' and a release permit issued upon receiving satisfactory sample results from E&RC.
- C. The tank contents may be transferred to Waste Condensate Tank 'C', recirculated for at least 2 hours, and a release permit issued upon satisfactory sample results from E&RC.
- D. A release permit cannot be issued until the Waste Condensate Recirculation Pump is repaired, the tank recirculated for at least 1 hour, and satisfactory sample results are obtained from E&RC.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Recirc time required is 1 hour
- B. Incorrect. Cannot connect pump B to Tank E
- C. Incorrect. Tank C uses same pump as Tank E
- D. Correct.

Technical Reference(s): SD 023

(Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	071K5.04	
	Importance Rating	2.5	3.1

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

Proposed Question: Common 11

Which ONE (1) of the following limits is designed to prevent a flammable mixture from existing in the Waste Gas System?

- A. Oxygen concentration is maintained $\leq 4\%$ when Hydrogen concentration is $> 4\%$.
- B. Hydrogen concentration is maintained $\leq 6\%$ when Oxygen concentration is $> 4\%$.
- C. Gas Decay Tank pressure is maintained > 10 psig.
- D. Gas Decay Tank pressure is maintained < 110 psig.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. O₂ is controlled. H₂ may be high due to nature of gasses present
- C. Incorrect. Pressure > 5 psig to ensure no vacuum on WHUT
- D. Incorrect. Pressure < 110 psig to prevent inadvertent release

Technical Reference(s): OP-702 precautions (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>2</u>
	Group #	<u>1</u>	<u>1</u>
	K/A #	<u>072A3.01</u>	
	Importance Rating	<u>2.9</u>	<u>3.1</u>

Ability to monitor automatic operation of the ARM System including: Changes in ventilation alignment

Proposed Question: Common 12

Which ONE (1) of the following describes the effect that a high radiation signal on Control Room Area Monitor R-1 will have on the Control Room Ventilation System?

- A. Exhaust Fan HVE-16 starts.
- B. Recirculation Fan HVE-19A starts.
- C. Ventilation intake damper opens.
- D. Filter Bypass damper opens.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Fan stops
- B. Correct.
- C. Incorrect. Damper closes
- D. Incorrect. Damper remains closed

Technical Reference(s): AOP-005, Att. 1 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	1	1
	K/A #	068K1.07	
	Importance Rating	2.7	2.9

Knowledge of the interrelations and/or cause-effect relationships between the Liquid Radwaste System and the following: Sources of liquid waste for LRS

Proposed Question: Common 13

Which ONE (1) of the following tanks collects leakoff from the #2 RCP seal?

- A. Waste Holdup Tank
- B. Pressurizer Relief Tank
- C. Reactor Coolant Drain Tank
- D. Volume Control Tank

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Other sources pumped there for disposal
- B. Incorrect. Tank drains to RCDT also
- C. Correct.
- D. Incorrect. #1 seal L/O through seal return HX to VCT

Technical Reference(s): SD 023 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	002K6.02	
	Importance Rating	3.6	3.8

Knowledge of the effect of a loss or malfunction on the following will have on the Reactor Coolant System (RCS): RCP

Proposed Question: Common 14

While at 20% power with a power ascension in progress, RCP 'B' trips due to an overcurrent condition.

No operator action has been taken and no rod motion has occurred.

Which ONE (1) of the following describes the INITIAL reactor and Loop 2 response?

- A. A reactor trip WILL occur and Loop 2 Tavg will INCREASE.
- B. A reactor trip WILL occur and Loop 2 Tavg will DECREASE.
- C. A reactor trip WILL NOT occur and Loop 2 Tavg will DECREASE.
- D. A reactor trip WILL NOT occur and Loop 2 Tavg will INCREASE.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Opposite of correct
- B. Incorrect. No trip below 40% power
- C. Correct.
- D. Incorrect. Tavg will decrease

Technical Reference(s): SD-011 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	010K6.02	
	Importance Rating	3.2	3.5

Knowledge of the effect of a loss or malfunction on the following will have on the Pressurizer Pressure Control System (PZR PCS):
PZR

Proposed Question: Common 15

Given the following conditions:

- The plant is operating at 100% power.
- All control systems are operating normally in automatic.
- A reference leg leak develops in Pressurizer level transmitter LT-459.
- Pressurizer pressure remains stable.

Which ONE (1) of the following describes the FIRST effect on the Pressurizer Pressure Control System?

- A. Backup Heaters energize.
- B. Control Group Heaters will go to full voltage.
- C. Backup Heaters will deenergize.
- D. Control Group Heaters will go to minimum voltage.

Proposed Answer: A

Explanation (Optional):

- A. Correct. Level deviation of 5% will energize backup heaters
- B. Incorrect. Unaffected
- C. Incorrect. Indicated level will rise. Will not drop to heater cutout prior to level deviation
- D. Incorrect. Control Group Heaters are unaffected

Technical Reference(s): PZR SD

(Attach if not previously provided)

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

Knowledge of electrical power supplies to the following: Pressurizer Level Control System (PZR LCS): Charging pumps

Proposed Question: Common 16

Given the following conditions:

- The unit has experienced a Loss of Off-Site power.
- Reactor trip and Turbine trip are verified.
- EPP-1, Loss of All AC Power, was implemented until the Inside AO restored power to 480V bus E-2 per attachment 6 of EPP-1.
- The crew has transitioned to PATH-1.
- SI has NOT occurred and is NOT required.

Which ONE (1) of the following describes how power will be supplied to the Charging Pumps?

	<u>From 'B' EDG</u>	<u>From DSDG</u>
A.	Charging Pump 'B'	Charging Pump 'A'
B.	Charging Pump 'C'	Charging Pump 'B'
C.	Charging Pump 'B'	Charging Pump 'C'
D.	Charging Pump 'C'	Charging Pump 'A'

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Wrong for pump B
- B. Incorrect. Wrong for pump B
- C. Incorrect. Wrong for both pumps

D. correct

Technical Reference(s): EDP-002 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	012A303	
	Importance Rating	3.4	3.5

Ability to monitor automatic operations of the Reactor Protection System including: Power supply

Proposed Question: Common 17

Given the following conditions:

- Plant is operating at 100% RTP.
- All systems are in normal alignment.
- All equipment is in service.

120 VAC Instrument Bus 1 is de-energized due to a bus fault.

Which ONE (1) of the following describes the effect on the Reactor Protection System (RPS)?

- The reactor will trip immediately due to loss of the Train 'A' RPS Logic channel.
- The reactor will trip immediately due to the loss of channel 1 Analog Protection Channel.
- The reactor will trip ONLY if Train 'B' RPS Logic Channel is in TEST IAW MST-021, Reactor Protection Logic Train 'B' at Power.
- The reactor will trip ONLY if a bistable from Analog Protection Channels 2, 3, or 4 is tripped.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Not power supply to logic channel
- Incorrect. Logic for protection channel is 2/4. Only 1 channel failed
- Incorrect. Not power supply to logic channel
- Correct. If another channel has a bistable tripped, reactor will trip due to 2/4

Technical Reference(s): RPS SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	026K4.01	
	Importance Rating	4.2	4.3

Knowledge of Containment Spray System design features or interlocks which provide for the following: Source of water for CSS, including recirculation phase after a LOCA

Proposed Question: Common 18

Given the following conditions:

- A reactor trip and SI have occurred.
- CV Spray has actuated.
- The RWST is empty.
- Containment Spray pumps are secured.
- CV pressure is 11 psig.

Which ONE (1) of the following system alignments describes how Containment Spray flow will be reestablished IAW EPP-9, Transfer to Cold Leg Recirculation?

- A. Aligning the discharge from the RHR Heat Exchangers to the Spray Pump suction.
- B. Aligning the discharge from the SI Pump Recirculation lines to the Spray Pump suction.
- C. Aligning the discharge from the RHR Heat Exchangers to the Spray Pump Recirculation lines; Spray Pumps will remain secured.
- D. Aligning the discharge from the RHR Heat Exchangers to the SI Pumps and from the discharge of the SI Pumps to the Spray Pump suction.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Recirc. Flow goes straight to the Spray Pumps from RHR Heat Exchangers
- C. Incorrect. Inaccurate description of piggy-back mode of operation. CV pressure greater than 10 psig; spray flow necessary
- D. Incorrect. SI Pump discharge not directed to the CV Spray Pumps

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	026K3.01	
	Importance Rating	3.9	4.1

Knowledge of the effect that a loss or malfunction of the Containment Spray System (CSS) will have on the following: CSS

Proposed Question: Common 19

Given the following conditions:

- A LOCA has occurred.
- Containment Pressure indicates 18 psig.
- Both Containment Spray Pumps are operating.
- Containment Spray valves powered from MCC-5 failed to reposition.

Which ONE (1) of the following describes the effect on the Containment Spray System?

- There is no suction path available to CV Spray Pump 'A'. CV Spray Pump 'B' has a suction source.
- There is no discharge path available from CV Spray Pump 'A'. There is a discharge path available from CV Spray Pump 'B'.
- CV Spray Pump 'A' will provide spray at the pump runout value. 'B' CV Spray Pump will provide spray flow at the normal flowrate.
- CV Spray Pumps 'A' and 'B' will provide spray flow at approximately the normal flow rate.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Suction valves not required to reposition
- Incorrect. The flowpath will not be closed. Parallel valves in discharge line
- Incorrect. Pump runout will not occur for normal flowpath. Would require pipe break
- Correct. One discharge valve will realign to provide flow from both Spray Pumps at

normal flowrate

Technical Reference(s): CSS SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>2</u>
	Group #	<u>2</u>	<u>2</u>
	K/A #	<u>033K105</u>	
	Importance Rating	<u>2.7</u>	<u>2.8</u>

Knowledge of the physical connections and/or cause-effect relationships between Spent Fuel Pool Cooling System (SFPCS) and the following: RWST

Proposed Question: Common 20

Which ONE (1) of the following correctly describes the sources available for fill and drain of the SFP?

	<u>FILL</u>	<u>DRAIN</u>
A.	DW Only	WHUT Only
B.	RWST Only	RWST Only
C.	DW or RWST	DW or WHUT
D.	DW or RWST	RWST or WHUT

Proposed Answer: D

Explanation (Optional):

- A. Incorrect because RWST is available for fill or drain
- B. Incorrect because DW available for fill. WHUT available for drain
- C. Incorrect because DW not available for drain
- D. Correct

Technical Reference(s): OP-910, OP-913 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		2	2
Group #		2	2
K/A #		033K301	
Importance Rating		2.6	3.1

Knowledge of the effect that a loss or malfunction of the Spent Fuel Pool Cooling System will have on the following: Area ventilation systems

Proposed Question: Common 21

Given the following conditions:

A leak in the SFP Cooling System has occurred, resulting in a rapid loss of SFP level.

- R-20, Fuel Handling Building Lower Level-Low Range Noble Gas Monitor, goes into alarm.
- Three minutes later, R-21, Fuel handling Building Upper Level-Noble Gas Monitor, goes into alarm.

Which ONE (1) of the following describes the operation of the Fuel Handling Building Ventilation System for this event?

- The alarm on R-20 will automatically trip HVE-15, Fuel Handling Building Exhaust Fan.
- The alarm on R-21 will automatically trip HVE-15, Fuel Handling Building Exhaust Fan.
- Both R-20 and R-21 alarms are required to automatically trip HVE-15, Fuel Handling Building Exhaust Fan.
- HVE-15, Fuel Handling Building Exhaust Fan, must be manually stopped and HVS-4, Fuel Handling Building Air Handling Unit, must be manually secured.

Proposed Answer: B

Explanation (Optional):

- Incorrect. R-20 is low range. No auto trip, alarm only
- Correct
- Incorrect because only R-21 is required

D. Incorrect because fan and AHU automatically shut down on high rads

Technical Reference(s): SD036 Page 10 (Attach if not previously provided)

APP-036-D8

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		2	2
Group #		2	2
K/A #		035K4.01	
Importance Rating		3.6	3.8

Knowledge of Steam Generator System (S/GS) design feature(s) and or interlock(s) which provide for the following: S/G level control

Proposed Question: Common 22

Assuming no action by the crew, which ONE (1) of the following SG 'A' transmitter failures will cause the 'A' Feedwater Regulating Valve to **initially** respond in the OPEN direction?

- A. SG pressure fails LOW.
- B. SG steam flow fails HIGH.
- C. SG feedwater flow fails HIGH.
- D. SG narrow range level fails HIGH.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Pressure low = steam flow low = close valve
- B. Correct
- C. Incorrect. Feed flow high means valve starts to close
- D. Incorrect. Level high means valve starts to close

Technical Reference(s): SD048 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	062 G2.1.33	
	Importance Rating	3.4	

Ability to recognize indications for system operating parameters which are entry level conditions for Technical Specifications

Proposed Question: RO 23

The plant is operating at 100% RTP.

Both EDGs are declared INOPERABLE due to a common mode failure. Which ONE (1) of the following actions are required?

- A. Immediately verify availability of Off-Site Power sources. Restore at least 1 EDG within 6 hours or enter TS 3.0.3.
- B. Immediately enter TS 3.0.3 and make preparations for a plant shutdown.
- C. Immediately verify availability of Off-Site Power sources. Restore at least 1 EDG to OPERABLE status within 24 hours or enter TS 3.0.3.
- D. Return at least 1 EDG to OPERABLE status within 24 hours or enter TS 3.0.3 and make preparations for a plant shutdown.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Off-Site source alignment is required within 1 hour for failure of 1 EDG
- B. Correct. Both trains, enter 3.0.3
- C. Incorrect. 24 hours is a grace period to perform surveillance testing for missing surveillances prior to applying TS action to a component
- D. Incorrect. 24 hours applies to surveillance requirements only

Technical Reference(s): TS section 3.8, 3.0.3 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	062 G2.1.33	
	Importance Rating		4.0

Ability to recognize indications for system operating parameters which are entry level conditions for Technical Specifications

Proposed Question: SRO 23

The plant is operating at 100% RTP.

- EDG 'A' has been OOS for 40 hours. Expected to return to service in 30 hours.
- It is discovered that there is no documentation of the last monthly surveillance on EDG 'B'. The most recent documentation of operability is 48 days old.

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

- Perform the missing surveillance to verify the operability of 'B' EDG within 1 hour or take action IAW TS 3.0.3.
- Perform the missed surveillance to verify the operability of EDG 'B' within 24 hours or take action IAW TS 3.0.3.
- Declare 'B' EDG INOPERABLE and immediately take action in accordance with TS 3.0.3.
- Declare EDG 'B' INOPERABLE. Perform the missed surveillance to verify the operability of 'B' EDG within 24 hours or take action IAW TS 3.0.3.

Proposed Answer: B

Explanation (Optional):

- Incorrect. 24 hours is allowed for missed surveillances greater than 24 hours
- Correct.
- Incorrect. EDG is not declared inoperable until it is proven inoperable
- Incorrect. EDG is not declared inoperable until it is proven inoperable

Technical Reference(s): TS section 3.8, 3.0.3 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	063K3.01	
	Importance Rating	3.7	4.1

Knowledge of the effect that a loss or malfunction of the D.C. Electrical Distribution System will have on the following: ED/G

Proposed Question: Common 24

The plant is at 100% RTP.

Which ONE (1) of the following describes the effect of losing DC Bus 'A'?

- A. EDG "A" automatically starts but will NOT field flash nor close its output breaker.
- B. EDG "B" automatically starts and will field flash, and its output breaker will close.
- C. EDG 'A' automatic start is disabled.
- D. EDG 'B' automatic start is disabled.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. "B" EDG will start on the SI but the "B" EDG output breaker will not close since E-2 is powered from offsite
- C. Incorrect. Start not disabled but field flash is
- D. Incorrect. Not powered from DC 'A'

Technical Reference(s): EPP-26 _____ (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	1
	K/A #	063K401	
	Importance Rating	2.7	3.0

Knowledge of D.C. Electrical Distribution System design feature(s) and or interlock(s) which provide for the following:
Manual/automatic transfers of control

Proposed Question: Common 25

Given the following conditions:

A fire has occurred in DC Distribution Panel 'B'. The panel is de-energized.

Which ONE (1) of the following describes the effect on the Electrical Distribution System?

- A. Control Power lost to 4160V Busses 3 & 4. Control Power can be restored using a safety switch in the 4160 Switchgear Room.
- B. Control Power lost to 4160V Busses 3 & 4 and cannot be restored.
- C. Control Power lost to 4160V Busses 1 & 2. Control Power can be restored using a safety switch in the 4160 Switchgear Room.
- D. Control Power lost to 4160V Busses 1 & 2 and cannot be restored.

Proposed Answer: A

Explanation (Optional):

- A. Correct. EPP-27, Attachment 2, Locally Restoring Deenergized AC Busses, step 6
- B. Incorrect. Control Power can be restored using the safety switch
- C. Incorrect. Control Power lost to 4160V Busses 3 & 4
- D. Incorrect. Control Power lost to 4160V Busses 3 & 4

Technical Reference(s): EPP-027 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	064A108	
	Importance Rating	3.1	3.4

Ability to predict and/or monitor changes in parameters associated with operating the Emergency Diesel Generator (ED/G) System controls including: Maintaining minimum load on ED/G (to prevent reverse power)

Proposed Question: Common 26

Given the following conditions:

- Plant is operating at 100% RTP.
- EDG 'A' is started for surveillance testing.

When EDG 'A' Output Breaker is closed onto Bus E-1, how is a reverse power condition prevented?

- Ensure synchroscope is rotating slowly in the 'FAST' (clockwise) direction.
- Ensure running and incoming currents are matched prior to closing the output breaker.
- Ensure running and incoming voltages are matched prior to closing the output breaker.
- Ensure running and incoming frequencies are matched prior to closing the output breaker.

Proposed Answer: A

Explanation (Optional):

- Correct
- Incorrect. Running and incoming currents being matched would make no difference, as actual current flow is transferred by motive force
- Incorrect. Ensuring voltage is matched ensures no large reactive current flow on breaker closure
- Incorrect. Matching frequency may actually increase the chance of reverse power because the incoming machine will take less load on parallel

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	064A401	
	Importance Rating	4.0	4.3

Ability to Operate and/or monitor in the control room: Local and Remote operation of EDG

Proposed Question: Common 27

Which ONE (1) of the following describes the operation of EDG 'B' if its LOCAL-REMOTE switch is placed in the LOCAL position at the DG Engine Control Panel?

- A. May be started from RTGB and output breaker may be closed from RTGB, but the EDG will not go through a pre-lube cycle.
- B. May not be started from RTGB but output breaker may be closed from RTGB.
- C. May not be started from RTGB and output breaker may not be closed from RTGB.
- D. May be started from RTGB, but EDG will not start automatically on safeguards actuation.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. May not be started from RTGB in LOCAL
- B. Correct
- C. Incorrect. Output breaker may still be closed from RTGB
- D. Incorrect. May not start from RTGB

Technical Reference(s): EDG SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	073K401	
	Importance Rating	4.0	4.3

Knowledge of Process Radiation Monitoring (PRM) System design feature(s) and or interlock(s) which provide for the following:
Release termination when radiation exceeds setpoint

Proposed Question: Common 28

Which ONE (1) of the following choices contains ONLY radiation monitors that will isolate a release path if the associated HI RAD setpoint is exceeded?

- A. R-14C, Main Vent Stack (Low Range-Noble Gas)
R-18, Liquid Waste Disposal
- B. R-14D, Main Vent Stack Mid-Range
R-37, Condensate Polisher Liquid Waste
- C. R-1, Control Room Air
R-15, Air Ejector Gas
- D. R-11, CV Particulate
R-17, Component Cooling Water

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. R-14D no auto action
- C. Incorrect. R-15 no auto action
- D. Incorrect. R-17 no auto action

Technical Reference(s): RMS SD, Attachment 10.2 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	075A2.03	
	Importance Rating	2.5	

Ability to (a) predict the impacts of the following on the Circulating Water System (CWS) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Safety features and relationship between condenser, turbine trip, and steam dump

Proposed Question: RO 29

Given the following conditions:

- The plant is at 35% RTP.
- Circulating Water Pump 'A' is OOS.
- 4KV Bus #4 deenergizes due to a fault.

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

- Verify Reactor Trip.
- Verify SDAFW Pump starts.
- Verify 'B' EDG starts.
- Verify bus transfer from the UAT to the SUT.

Proposed Answer: A

Explanation (Optional):

- Correct. Reactor Trip due to Turbine trip due to loss of 3 Circ Pumps (Bus 4 feeds bus 5)
- Incorrect. Requires low volts on bus 1 AND bus 4
- Incorrect. Bus 4 fault will not start EDG
- Incorrect. Transfer will not occur for 1 minute after the trip

Technical Reference(s): PATH-1, RPS SD

(Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	075A2.03	
	Importance Rating		2.8

Ability to (a) predict the impacts of the following on the Circulating Water System (CWS) and (B) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Safety features and relationship between condenser, turbine trip, and steam dump

Proposed Question: SRO 29

Given the following conditions:

- The plant is at 35% RTP.
- Circulating Water Pump 'A' is OOS.
- 4KV Bus #4 deenergizes due to an electrical fault.

Which ONE (1) of the following procedures should be implemented?

- Enter AOP-012, Partial Loss of Condenser Vacuum or Circulating Water Pump Trip.
- Enter AOP-024, Loss of Instrument Bus.
- Enter AOP-007, Turbine Trip Below P-7.
- Enter PATH-1, Reactor Trip or Safety Injection.

Proposed Answer: D

Explanation (Optional):

- Incorrect. All 3 Circ Pumps will be tripped.
- Incorrect. Instrument Bus will not be lost.
- Incorrect. Power is above P-7.
- Correct. Reactor Trip due to Turbine Trip.

Technical Reference(s): PATH-1, RPS SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	006A4.05	
	Importance Rating	3.9	

Ability to operate and/or monitor in the control room: Transfer of ECCS flowpaths prior to recirculation

Proposed Question: RO 30

Given the following plant conditions:

- The crew is performing EPP-9, Transfer to Cold Leg Recirculation, after a LOCA.
- The Inside AO reports that the critical steps of Attachment 1 are complete.
- The following conditions exist:
 - SI Pump 'A' running.
 - All RHR Pumps stopped.
 - All Charging Pumps stopped.
 - CV Spray Pump 'A' running.
 - All other SI and CV Spray Pumps are off.
 - RWST level is 8% and trending down.

Which ONE (1) of the following action(s) is required?

- A. Stop 'A' SI pump only.
- B. Stop 'A' CV Spray pump only and close its discharge valves.
- C. Stop the 'A' SI pump, stop 'A' CV Spray pump, and close the CV Spray pump discharge valves.
- D. Start one Charging Pump and establish Cold Leg Recirculation.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. All equipment off at 9%
- B. Incorrect. All equipment off at 9%
- C. Correct.

D. Incorrect. All equipment off at 9%

Technical Reference(s): EPP-9, step 10 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	011K5.12	
	Importance Rating		3.3

Knowledge of the operational implications of the following as they apply to PZR LCS: Criteria and purpose of pressurizer level program

Proposed Question: SRO 30

Which ONE (1) of the following describes the purpose of the pressurizer level program?

- A. Pressurizer level is ramped up from approximately 22% at no load Tav_g to maintain a constant mass in the RCS as Tav_g is increased.
- B. Pressurizer level is ramped up from approximately 22% at no load Tav_g to maintain a constant volume in the RCS as Tav_g is increased.
- C. Pressurizer level is ramped up from approximately 14% at no load Tav_g to maintain a constant mass in the RCS as Tav_g is increased.
- D. Pressurizer level is ramped up from approximately 14% at no load Tav_g to maintain a constant volume in the RCS as Tav_g is increased.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Setpoint is correct, but reason is not
- C. Incorrect. Setpoint is incorrect
- D. Incorrect. Reason and setpoint are incorrect

Technical Reference(s): SD 059 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	008A1.01	
	Importance Rating	2.8	

Ability to predict and/or monitor changes in parameters associated with operating the Component Cooling Water System (CCWS) controls including: CCW Flow Rate

Proposed Question: RO 31

Given the following conditions:

- Mode 1, 100% RTP.
- 'A' CCW Pump and Heat Exchanger are in service.
- The crew is isolating Component Cooling Water to the Spent Fuel Pit for Heat Exchanger maintenance.
- CCW flow on FI-613 indicates 2200 GPM and trending down.
- CCW pressure on PI-612 indicates 110 psig and trending up slowly.
- The RO opens CC-749A, CCW from RHR HX 'A'.

Which ONE (1) of the following describes the function provided by opening CC-749A?

- Ensures sufficient flow through a CCW pump to satisfy the minimum flow requirement.
- Ensures CCW flow limitations on the Non-Regenerative Heat Exchanger are not exceeded.
- Ensures CCW Heat Exchanger flow will remain below 2350 GPM to minimize damage from tube vibration.
- Reduce CCW system pressure to ensure design pressure of the RHR Heat Exchangers is not exceeded.

Proposed Answer: A

Explanation (Optional):

- Correct. CCW pumps are to be run continuously with >2200 gpm flow.
- Incorrect. Flow limitation concern is for the CCW pump
- Incorrect. The 2350 limit is for SFP HX
- Incorrect. System is sized so as not to exceed design pressures of HX. With system aligned for operation, pump discharge will not be high enough to overpressurize HX

Technical Reference(s): OP-306 section 8.4.3

(Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	035A2.02	
	Importance Rating	4.2	4.4

Ability to (a) predict the impacts of the following on the Steam Generating System (SGS) and (B) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Reactor Trip/Turbine Trip

Proposed Question: SRO 31 RO 81 Shows up twice in master worksheet

Given the following conditions:

- The reactor has tripped. SI is initiated. All equipment has started as required.
- The crew is performing PATH-1.
- RCS Pressure is 1250 psig.
- Containment pressure is 6 psig.
- Pressurizer level is off-scale low.
- SG pressures are approximately 1000 psig.
- All S/G NR levels are 20%.

Based on the above conditions, which ONE (1) of the following must be performed in PATH-1?

- Start SDAFW pump.
- Verify Containment Isolation Phase 'A'.
- Verify Containment Spray Actuation.
- Verify Containment Isolation Phase 'B'.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Indication does not require SDAFW
- Correct. Above CIA/MSLI pressure in ctmt
- Incorrect. Not above CIB pressure (Also Spray Setpoint)
- Incorrect. Not above CIB pressure

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A #	041A203	
	Importance Rating	2.7	3.2

Ability to (a) predict the impacts of the following on the Steam Dump System (SDS) and Turbine Bypass Control and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Loss of IAS

Proposed Question: Common 32

Given the following conditions:

- A Loss of Instrument Air has occurred. The plant was tripped due to a loss of Feedwater Control.
- MSIVs are CLOSED.
- Air pressure has NOT been restored.

Which ONE (1) of the following will be the preferred method of controlling RCS Heat Removal for these conditions?

- Steam Dump to Main Condenser
- Steam Line PORVs controlled by N2
- Main Steam Safety Valves
- Steam Line PORVs controlled from the RTGB

Proposed Answer: B

Explanation (Optional):

- Incorrect. Condenser dump valves unavailable due to MSIV closure
- Correct
- Incorrect. Safety valves will limit temperature change, but not used for control
- Incorrect. PORVs controlled from the Secondary Control Panel

Technical Reference(s): AOP-017 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A #	045K301	
	Importance Rating	2.9	3.2

Knowledge of the effect that a loss or malfunction of the Main Turbine Generator (MT/G) System will have on the following:
Remainder of the plant

Proposed Question: Common 33

Given the following conditions:

- The plant is at 8% RTP, 56 MWe gross.
- The Main Generator has just been synchronized to the grid. Turbine problems caused a small load rejection immediately following synchronization, but the plant is now stable.
- APP-009-A4, GEN PHASE DIFF TRIP, alarms in the control room, resulting in a generator lockout.

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

- Turbine Trip with 4KV bus fast transfer.
- Turbine Trip without 4KV bus fast transfer.
- Turbine Trip and Reactor Trip with 4KV bus fast transfer.
- Turbine Trip and Reactor Trip without 4KV bus fast transfer.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Bus transfer will not take place. Loads have not yet been transferred
- Correct
- Incorrect. No reactor trip below 10% power
- Incorrect. No reactor trip below 10% power, and 4 KV bus transfer takes place

Technical Reference(s): APP-009 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	3	3
	K/A #	078K301	
	Importance Rating	3.1	3.4

Knowledge of the effect that a loss of the IAS will have on the following: Containment air system

Proposed Question: Common 34

Given the following plant conditions:

- Reactor Trip and SI have occurred.
- CV pressure is currently 6 psig.

Which ONE (1) of the following correctly describes how to open PCV-1716, IA to CV?

The operator must:

- go to RESET to open PCV-1716, IA to CV.
- go to OVERRIDE to open PCV-1716, IA to CV.
- reset PHASE A, then go to RESET to open PCV-1716, IA to CV.
- reset PHASE B, then go to RESET to open PCV-1716, IA to CV.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Will not open with a Phase A signal
- Correct
- Incorrect. Cannot open without blocking the SI signal
- Incorrect. Cannot open without blocking the SI signal

Technical Reference(s): SD-017 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	G2.1.20	
	Importance Rating	3.1	3.2

Ability to execute procedure steps.

Proposed Question: Common 35

You have been assigned to perform a procedure designated 'Multiple Use' IAW PRO-NGGC-0200.

Which ONE (1) of the following identifies the use of this designation?

- A. One section of the procedure may be 'Continuous use' while another section may be designated 'Reference use'.
- B. One section may require dual verification of procedure steps while another section requires only one signoff per step.
- C. The performance of any one 'Continuous use' procedure section may require action in multiple locations.
- D. More than one individual will be required to complete the performance of the procedure.

Proposed Answer: A

Explanation (Optional):

- A. Correct. A multiple use procedure is identified as containing more than one level of use.
- B. Incorrect. The distractors are used to convey other uses of the word 'multiple', as in multiple signatures, locations, or personnel performance.
- C. Incorrect. The distractors are used to convey other uses of the word 'multiple', as in multiple signatures, locations, or personnel performance.
- D. Incorrect. The distractors are used to convey other uses of the word 'multiple', as in multiple signatures, locations, or personnel performance.

Technical Reference(s): PRO-NGGC-0200 section 9.2.7 (Attach if not previously provided)
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Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	2.1.27	
	Importance Rating	2.8	2.9

Knowledge of system purpose and or function.

Proposed Question: Common 36

The following conditions exist:

The plant is at 55% power.

A Loss of Feed occurs requiring a reactor trip. The reactor does NOT trip.

30 seconds after the reactor fails to trip, the following conditions are observed:

- SG 'A' Narrow Range level is 2%.
- SG 'B' Narrow Range level is 8%.
- SG 'C' Narrow Range level is 4%.

Which ONE (1) of the following is the expected response of the ATWS Mitigation System Actuation Circuitry (AMSAC)?

- AMSAC will not actuate because it is not armed.
- AMSAC will trip the Main Turbine and start the AFW pumps.
- AMSAC will NOT actuate because the reactor trip breakers are still closed.
- AMSAC will trip the reactor, start the AFW pumps, and close the SG blowdown sample valves.

Proposed Answer: B

Explanation (Optional):

- Incorrect. AMSAC is armed above 40% power (First stage pressure equivalent)
- Correct
- Incorrect. AMSAC actuation is independent of RTB position

D. Incorrect. No reactor trip generated from AMSAC

Technical Reference(s): AMSAC logic drawing (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	G2.1.29	
	Importance Rating	3.4	3.3

Knowledge of how to conduct and verify valve lineups.

Proposed Question: Common 37

Which ONE (1) of the following describes the ‘Hands on’ method used when verifying a Manual Valve in the open position?

- A. Valve movement should be in the OPEN direction and restored to 1/4 turn off its backseat.
- B. Valve movement should be in the CLOSED direction and restored to 1/4 turn off its backseat.
- C. Local valve position should be used, if available, so valve movement is not required.
- D. Note the valve position, move in CLOSED direction one and one-half turns, and restore to full open position.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Do not move in open direction
- B. Correct.
- C. Incorrect. Manual valves are not checked without positioning
- D. Incorrect. Not necessary for 1 ½ turns. Full open inappropriate

Technical Reference(s): OMM-001-8 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	G2.2.2	
	Importance Rating	4.0	3.5

Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.

Proposed Question: Common 38

The following conditions exist:

- Tavg is 540° F.
- Reactor Trip Breakers are OPEN.
- The STEAM DUMP T-AVG CONTROL BLOCKED status light is illuminated.

Which ONE (1) of the following contains the action(s) required to stabilize RCS temperature at 540 deg F?

- A. Place STEAM DUMP MODE SELECTOR SWITCH in STEAM PRESS, adjust PC-464B, STEAM HEADER PRESS as necessary.
- B. Place STEAM DUMP MODE SELECTOR SWITCH in STEAM PRESS, place STEAM DUMP CONTROL switch to ON, adjust PC-464B, STEAM HEADER PRESS as necessary.
- C. Momentarily place STEAM DUMP CONTROL switch to BYPASS T-AVG INTLK, then place switch to OFF.
- D. Place STEAM DUMP MODE SELECTOR SWITCH in STEAM PRESS, momentarily place STEAM DUMP CONTROL switch to BYPASS T-AVG INTLK, adjust PC-464B, STEAM HEADER PRESS as necessary.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. With the low Tavg interlock actuated, the steam dump control switch must be placed in bypass to clear the signal.
- B. Incorrect. With the low Tavg interlock actuated, the steam dump control switch must be placed in bypass to clear the signal.
- C. Incorrect. The steam dump will not operate if steam dumps are not in pressure control mode.
- D. Correct per GP-0002, section 8.5.33, page 86 of 111.

Technical Reference(s): GP-002, Step 8.5.33 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	G2.3.2	
	Importance Rating	2.5	2.5

Knowledge of facility ALARA program.

Proposed Question: Common 39

Given the following conditions:

- Mode 1 at 100% RTP.
- You have been directed to enter containment to perform a task.
- Your RWP states that your EPD dose alarm will be set at 80 mrem and your rate alarm will be set at 160 mrem/hr.
- When you log in to the Automated Access Control System, the computer screen warns you that RIMS is not operational.

Which ONE (1) of the following describes the settings for your EPD dose and rate alarms **and** what is the appropriate response to a dose alarm while you are performing a task?

- Dose – 50 mrem; Rate – 100 mrem/hr. Stop work, exit the area, notify Health Physics.
- Dose – 50 mrem; Rate – 100 mrem/hr. Stop work, stay exactly where you are, notify Health Physics.
- Dose – 40 mrem; Rate – 80 mrem/hr. Stop work, exit the area, notify Health Physics.
- Dose – 40 mrem; Rate – 80 mrem/hr. Stop work, stay exactly where you are, notify Health Physics.

Proposed Answer: A

Explanation (Optional):

- Correct. With RIMS out of service, default settings are 50mr and 100 mr/hr.
- Incorrect. Anytime the dosimeter alarms you should leave the area.
- Incorrect. Wrong dosimeter settings
- Incorrect. Wrong dosimeter settings

Technical Reference(s): PLP-016 (Attach if not previously provided)

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

Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.

Proposed Question: Common 40

Given the following conditions:

- Mode 1 at 100% when a LBLOCA occurred.
- A General Emergency has been in effect for 6 hours.

Which ONE (1) of the following is the TEDE limit for performing Life-Saving actions?

- A. 5 Rem
- B. 25 Rem
- C. 75 Rem
- D. 250 Rem

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Annual TEDE limit
- B. Correct. Lifesaving action 25 Rem
- C. Incorrect.
- D. Incorrect

Technical Reference(s): EPTSC-04, step 8.4.3.16.b, (Attach if not previously provided)
page 4-9

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

Ability to control radiation releases.

Proposed Question: Common 41

Given the following conditions:

- The plant is operating at 100% RTP.
- WGDT 'A' is being released.
- Annunciator APP-036-E7, RAD MONITOR TROUBLE, alarms.
- The R-14C, Plant Vent Monitor, FAIL alarm is illuminated.

Which ONE (1) of the following describes the impact of these conditions on the waste gas release in progress and the appropriate actions and requirements necessary to make a subsequent release?

- The release will continue and must be manually stopped. Subsequent waste gas releases may be performed provided R-14A or R-14B are in service.
- The release will continue and must be manually stopped. Subsequent waste gas releases will not be possible until the FAIL alarm has cleared.
- The release automatically stops. Subsequent waste gas releases may be performed provided R-14A or R-14B are in service.
- The release automatically stops. Subsequent waste gas releases will not be possible until the FAIL alarm has cleared.

Proposed Answer: D

Explanation (Optional):

- Incorrect. RCV-014 fails closed
- Incorrect. RCV-014 fails closed
- Incorrect. No release possible until FAIL alarm clears
- Correct.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	G2.4.3	
	Importance Rating	3.5	3.8

Ability to identify post-accident instrumentation.

Proposed Question: Common 42

In accordance with OMM-022, EOP User’s Guide, which ONE (1) of the following provides the correct indication that the operator should use for RCS Wide Range pressure indication when in the EOP network?

- A. ICCM
- B. PI-501, RCS WIDE RANGE PRESSURE
- C. PI-402, WIDE RANGE PRESS
- D. PI-455, PROT CHANNEL 1 PZR PRESS

Proposed Answer: A

Explanation (Optional):

- A. Correct. Required by the EOP users guide due to accuracy under accident conditions.
- B. Incorrect. Not as accurate under accident conditions.
- C. Incorrect. Not as accurate under accident conditions
- D. Incorrect. Not as accurate for accident conditions.

Technical Reference(s): OMM-022 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		3	3
Group #			
K/A #		2.4.26	
Importance Rating		2.9	3.3

Knowledge of facility protection requirements including fire brigade and portable fire fighting equipment usage.

Proposed Question: Common 43

Which ONE (1) of the following procedures contains the specific room guidelines for the Fire Brigade to fight a fire in the Aux Building?

- A. OMM-002, Fire Protection Manual
- B. OMM-003, Fire Protection Pre-Plans
- C. FP-001, Fire Emergency
- D. OP-801, Fire Water System

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Contains rules and guidelines for fire protection policy, etc.
- B. Correct
- C. Incorrect. Provides Control Room action and responsibility
- D. Incorrect. Provides operating instructions for the fire water system

Technical Reference(s): OMM-003 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	3
	Group #		
	K/A #	G2.4.49	
	Importance Rating	4.0	4.0

Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Proposed Question: Common 44

Given the following plant conditions:

- Reactor power is at 100%.
- Off-Site power is lost causing a reactor trip.
- The Emergency Diesel Generators fail to start.
- The Turbine Stop valves are not closed.

Which ONE (1) of the following describes an action that should be taken in this situation in accordance with EPP-001, 'Loss of All AC Power'?

- Emergency Borate using MOV-350.
- Close the MSIVs and bypasses.
- Manually run the turbine back with the limiter.
- Manually run the turbine back with the governor valve DECREASE button.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Action to attempt turbine trip at step 2 of EPP-001 is to close MSIVs and bypass valves
- Correct.
- Incorrect. Alternate means of tripping the turbine are not provided for EPP-001
- Incorrect. Alternate means of tripping the turbine are not provided for EPP-001

Technical Reference(s): EPP-1, step 2 RNO (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		015/017AK2.07	
Importance Rating		2.9	2.9

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

Proposed Question: Common 45

Which ONE (1) of the following explains the reason for closing the seal return valve after securing a Reactor Coolant Pump with a high #1 Seal Leakoff flow?

- A. Establish a pressure boundary at the #2 seal.
- B. Prevent overflowing the RCP standpipe.
- C. Minimize heat load on seal return heat exchanger.
- D. Prevent flow damage to the Thermal Barrier Heat Exchanger.

Proposed Answer: A

Explanation (Optional):

- A. Correct. Seal return valve is closed to minimize inventory loss & establish a pressure boundary at the #2 seal
- B. Incorrect. Standpipe should not overflow unless there is leakage past #2 seal
- C. Incorrect. Even a high seal flow would not be above the capacity of the Seal Return HX
- D. Incorrect. TBHX should not be affected unless it is leaking

Technical Reference(s): AOP-018 basis (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		026AA1.02	
Importance Rating		3.2	3.3

Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water (CCW):

Loads on the CCWS in the Control Room

Proposed Question: Common 46

Following an alarm on R-17, Component Cooling Water Process Radiation Monitor, the crew is performing actions contained in AOP-014, Component Cooling Water System Malfunction.

Prior to leak isolation being performed, which ONE (1) of the following describes the indication that would exist if the leak were in the Non-Regenerative Heat Exchanger?

- A. Letdown flow will increase.
- B. TCV-143, VCT/DEMIN DIV valve, will automatically divert to VCT.
- C. Letdown flow will decrease.
- D. LCV-115A, VCT/HLDP TK DIV valve, will divert to the HUT.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Leak into CCW. Flow will decrease
- B. Incorrect. Temp should not change enough to cause divert. Should already be aligned to VCT
- C. Correct.
- D. Incorrect. VCT level will go down. Divert should not operate

Technical Reference(s): AOP-014, section B (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		0026AA201	
Importance Rating		2.9	3.5

Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: Location of a leak in the CCWS

Proposed Question: Common 47

Given the following conditions:

- Mode 1 at 100% RTP.
- CCW Surge Tank level is RISING.

Which ONE (1) of the following components, if leaking, could account for this level change?

- A. RCP Thermal Barrier Heat Exchanger
- B. CVCS Seal Water Return Heat Exchanger
- C. RHR Pump seal cooler
- D. CCW/SW Heat Exchanger

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Lower pressure than CCW
- C. Incorrect. Lower pressure than CCW
- D. Incorrect. Lower pressure than CCW

Technical Reference(s): AOP-014 Basis (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	055 G2.4.1	
	Importance Rating	4.3	

Knowledge of EOP Entry conditions and Immediate Action steps

Proposed Question: RO 48

Given the following conditions:

- The plant is operating at 100% power.
- EDG 'A' is out of service, expected to return to service in 2 hours.
- A Loss of Off-Site power occurs.
- The reactor is tripped and the crew enters PATH-1.

The crew made a transition to FRP-H.1, Loss of Secondary Heat Sink, based on a CSFST RED Path.

Subsequently, EDG 'B' trips.

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

- A. Immediately transition to EPP-1, Loss of All AC Power.
- B. Restore feed in FRP-H.1, and then return to PATH-1 to restore the EDG.
- C. Remain in FRP-H.1 until directed to return to procedure in effect, and then transition to EPP-1, Loss of All AC Power.
- D. Remain in FRP-H.1 unless a higher priority RED condition is observed. When directed to return to procedure in effect, return to PATH-1. Restore EDG 'B' in EPP-4, Reactor Trip Response.

Proposed Answer: A

Explanation (Optional):

- A. Correct

- B. Incorrect. No AC available. Go to EPP-1
- C. Incorrect. Transition immediately.
- D. Incorrect. Could be correct if only 1 EDG was tripped

Technical Reference(s): OMM-22, EPP-1 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	025 G2.4.7	_____
	Importance Rating	_____	3.8

Knowledge of event based EOP mitigation strategies

Proposed Question: SRO 48

Given the following conditions:

- A loss of RHR is in progress due to a loss of Component Cooling Water.
- The crew is performing actions contained in AOP-020, Loss of Residual Heat Removal, Section B, Loss of RHR with Vessel Head Off.

Which ONE (1) of the following describes the preferred method of recovering RCS heat removal?

- A. Cold Leg Injection.
- B. Reflux boiling.
- C. Natural Circulation.
- D. Hot Leg Injection.

Proposed Answer: A

Explanation (Optional):

- A. Correct. Section B requires Cold Leg Injection valves opened.
- B. Incorrect. Reflux would not be a strategy in Loss of RHR unless there was no makeup available and SGs could provide heat sink with head on.
- C. Incorrect. Natural Circ may be performed if the vessel head was still on.
- D. Incorrect. Hot Leg Injection would be performed if there was a cold leg opening

Technical Reference(s): AOP-20 section B (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		E08EK1.1	
Importance Rating		3.5	3.8

Knowledge of the operational implications of the following concepts as they apply to Pressurized Thermal Shock: Components, capacity, and function of emergency systems

Proposed Question: Common 49

Given the following conditions:

- A SBLOCA has occurred.
- RCPs have been stopped IAW FOLDOUT 'A' criteria.
- Containment pressure is 8 psig.
- The crew is in FRP-P.1, Response to Imminent Pressurized Thermal Shock, due to a CSFST RED Path.
- SI cannot be secured due to the present subcooling condition.

Which ONE (1) of the following states the minimum subcooling required to restart an RCP and what is the basis for starting an RCP under these conditions?

- 35° F; provides core cooling.
- 55° F; provides core cooling.
- 35° F; provides mixing of warm RCS and cold SI water.
- 55° F; provides mixing of warm RCS and cold SI water.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Wrong reason and value (Adverse exists)
- Incorrect. Wrong reason
- Incorrect. Wrong value
- Correct.

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		051AK3.01	
Importance Rating		2.8	3.1

Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: Loss of steam dump capability upon loss of condenser vacuum

Proposed Question: Common 50

Given the following conditions:

- A loss of condenser vacuum has occurred, resulting in a unit trip.
- All 3 Circulating Water pumps are running.
- Actual Condenser Backpressure stabilizes at 12 inches Hg absolute.
- The demand signal on the Steam Dump pressure controller is at 50%.
- The operator transfers the Steam Dump Mode Switch from Tavg mode to Steam Press mode.

Which ONE (1) of the following provides the response of the steam dump valves?

- A. 3 valves open.
- B. 2 valves open.
- C. All valves remain closed.
- D. All valves open.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. 12" Hg will not allow arming
- B. Incorrect. Not armed
- C. Correct.
- D. Incorrect. Not armed

Technical Reference(s): Steam Dump SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	057AA105	
	Importance Rating	3.2	3.4

Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Electrical Instrument Bus: Backup instrument indications

Proposed Question: Common 51

Given the following conditions:

- The plant is at 100% RTP.
- Due to loss of multiple indications, a loss of Instrument Bus is suspected.
- The following conditions exist:
 - SG 'A' Feed Reg Valve must be controlled in manual. All other Feed Reg Valves are operating properly in automatic.
 - Many bistable status lights are illuminated.
 - All NIS control and instrument power lights are illuminated.

Which ONE (1) of the following instrument busses has been lost?

- A. 1
- B. 3
- C. 6
- D. 8

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Loss of this bus will result in loss of NI indication
- B. Incorrect. Loss of this bus will result in loss of NI indication
- C. Correct
- D. Incorrect. Loss will affect other FRVs

Technical Reference(s): 120VAC SD (Attach if not previously provided)
AOP-024

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		067AK302	
Importance Rating		2.5	3.3

Knowledge of the reasons for the following responses as they apply to Plant Fire on Site: Steps called out in the site fire protection plan, FPS manual, and fire zone manual

Proposed Question: Common 52

The Fire Brigade has responded to a fire in the Aux Building.

The Team Leader calls for a water suppression attack. There is potentially energized electrical equipment inside the fire area.

Which ONE (1) of the following will be the preferred method of extinguishing the fire?

- A. Fog pattern from at least 10 feet away because it minimizes the potential for electrical shock.
- B. Stream pattern from at least 10 feet away because it minimizes the potential for electrical shock.
- C. Foam Spray because the foam is non-conductive.
- D. Foam Spray because the foam is the least corrosive on electrical components.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Most dangerous
- C. Incorrect. Foam is highly conductive
- D. Incorrect. Foam will be corrosive to electrical components

Technical Reference(s): OMM-003 caution (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	068AK202	
	Importance Rating	3.7	3.9

Knowledge of the interrelations between Control Room Evacuation and the following: Reactor trip system

Proposed Question: Common 53

Given the following conditions:

- Unit 2 is at 50% power.
- Due to toxic smoke in the control room, evacuation has been ordered.

Which ONE (1) of the following is NOT directed to be performed prior to evacuating the control room IAW AOP-004, Control Room Inaccessibility?

- Check Reactor Trip.
- Check Turbine Trip.
- Isolate Letdown.
- Close FRVs and Bypasses.

Proposed Answer: D

Explanation (Optional):

- Incorrect. First action
- Incorrect. Second action
- Incorrect. Third action
- Correct. If FRVs must be closed it can be done in the plant

Technical Reference(s): AOP-004, CR Inaccessibility (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		024AK3.02	
Importance Rating		4.2	4.4

Knowledge of the reasons for the following responses as they apply to the Emergency Boration: EOPs Reasons for actions contained in

Proposed Question: Common 54

The crew is performing actions contained in FRP-S.1, Response to Nuclear Power Generation/ATWS.

Which ONE (1) of the following describes the preferred boration flowpath and reason this flowpath is selected?

- A. Loop 2 Cold Leg because it is the most direct method available.
- B. Loop 1 Hot Leg because it is the most direct method available.
- C. Loop 2 Cold Leg because RCP Seal Injection flow will be maintained.
- D. Loop 1 Hot Leg because RCP Seal Injection flow will be maintained.

Proposed Answer: A

Explanation (Optional):

- A. Correct. Left hand column for procedure, first item
- B. Incorrect. Contingency if Cold Leg is unavailable
- C. Incorrect. Seal Injection will be maintained under either circumstance
- D. Incorrect. Seal Injection will be maintained under either circumstance

Technical Reference(s): FRP-S.1, Background (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	027AA1.05	_____
	Importance Rating	3.3	_____

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

Proposed Question: RO 55

Due to a Loss of Off-Site Power you are unable to energize PZR HTR BACKUP GROUP 'A' from the Control Room.

Which ONE (1) of the following describes the preferred method used to energize the heaters from an alternate source IAW EPP-21, Energizing Pressurizer Heaters from Emergency Busses?

- A. Energize from bus E-1 and operate from the Control Room.
- B. Energize from bus E-2 and operate from the Control Room.
- C. Energize from bus E-1 and operate from the Rod Control Room.
- D. Energize from bus E-2 and operate from the Rod Control Room.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Wrong bus and cannot be operated from CR
- C. Incorrect. Would be second choice if CR switch does not work
- D. Incorrect. Wrong Bus

Technical Reference(s): EPP-21 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	003AK1.07	_____
	Importance Rating	_____	3.9

Knowledge of the operational implications of the following concepts as they apply to the Dropped Control Rod: Effect of dropped rod on RIL/SDM

Proposed Question: SRO 55

Given the following plant conditions:

- The unit was at or near 100% power for 390 days.
- A secondary load rejection to 68% has just occurred.
- Control Bank D rod H4 indicates 0 inches.
- The rod bottom light for H4 is ON.
- The step counter for Control Bank D is at 105 Steps.
- AOP-001, Malfunction of Reactor Control System, has been entered.

Based on the above plant conditions, which ONE (1) of the following describes Control Rod position and any required action(s) IAW AOPs and APPs?

Note: References provided

- Rods are above the Technical Specification limit but below the LO-LO limit alarm. Borate to restore Control Rod Bank D to clear the LO-LO limit & LO limit alarms
- Rods are above the Technical Specification limit but below the LO-LO limit alarm. Borate to allow rod withdrawal to return Axial Flux Difference to the normal band within 30 minutes.
- No rod insertion limit has been exceeded. No actions are required.
- No rod insertion limit has been exceeded. Borate to allow rod withdrawal to return Axial Flux Difference to the normal band within 30 minutes.

Proposed Answer: A

Explanation (Optional):

- Correct.
- Incorrect. QPTR is affected, not AFD for dropped rod
- Incorrect. LO-LO rod insertion limit has been exceeded
- Incorrect. AFD Unaffected by dropped rod

Technical Reference(s): ITS section 3.1., Curve 1.9 A & Curve 1.9B (Attach if not previously provided)

APP-005-C5, AOP-001

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		E10EK3.1	
Importance Rating		3.4	3.7

Knowledge of the reasons for the following responses as they apply to Natural Circulation with Steam Void in Vessel with/without RVLIS: Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics

Proposed Question: Common 56

Given the following conditions:

- The plant tripped from 100% power.
- EPP-005, Natural Circulation Cooldown, is in progress.
- Natural Circulation has been verified.
- HVH-5A, CRDM Cooling Fan, is running.
- HVH-5B, CRDM Cooling Fan, tripped, and cannot be restarted.

Which ONE (1) of the following describes the required subcooling margin and cooldown rate for the current plant conditions?

- Required subcooling margin increases and cooldown rate is less restrictive.
- Required subcooling margin increases and cooldown rate is more restrictive.
- Required subcooling margin decreases and cooldown rate is less restrictive.
- Required subcooling margin decreases and cooldown rate is more restrictive.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Rate is more restrictive
- Correct
- Incorrect. Margin increases, rate is more restrictive
- Incorrect. Margin increases

Technical Reference(s): EPP-5 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		E12EK3.4	
Importance Rating		3.5	3.8

Knowledge of the reasons for the following responses as they apply to Uncontrolled Depressurization of all Steam Generators: RO or SRO function 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 57

In procedure EPP-016, Uncontrolled Depressurization of All Steam Generators, the Operator is directed to establish minimum feed flow to all three Steam Generators.

What is the basis for establishing flow in this range?

- A. Maintain minimum feed flow to ensure CST inventory is maintained until RHR can be placed in service.
- B. Maintain minimum feed flow to ensure adequate heat sink is maintained and entry to FRP-H.1, Response to Loss of Secondary Heat Sink, will **not** be required.
- C. Establish a minimum verifiable flow to ensure components remain wet so that thermal stresses are minimized upon a feed flow increase.
- D. Establish a minimum verifiable flow to reduce the risk of overflowing Steam Generators.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. CST is sized for any AFW flow
- B. Incorrect. Note in beginning of FRP-H.1 allows for operator action reducing feed
- C. Correct.
- D. Incorrect. Wrong reason for SGTR risk. Flow reduced to minimum, but SG should not boil dry

Technical Reference(s): EPP-016, step 9 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		1	1
K/A #		027AA1.01	
Importance Rating		4.0	3.9

Ability to operate and/or monitor the following as they apply to Pressurizer Pressure Control Malfunctions: PZR heaters, sprays and PORVs

Proposed Question: Common 58

Given the following conditions:

- The Unit was in MODE 1 at 100% RTP when a transient occurred.
- RCS pressure is 2175 psig.
- The crew has implemented AOP-019, Malfunction of RCS Pressure Control.

The crew is at a point in the procedure to determine if the master pressure controller, PC-444J, is operating properly in AUTO.

Which ONE (1) of the following would represent proper operation of PC-444J in AUTO based on current plant conditions?

Spray Valves CLOSED with.....

- all Heaters OFF.
- Proportional Heaters at 50% and Backup Heaters OFF.
- Proportional Heaters Full ON and Backup Heaters OFF.
- Proportional Heaters Full ON and Backup Heaters ON.

Proposed Answer: D

Explanation (Optional):

- Incorrect. All Heaters ON
- Incorrect. All Heaters ON
- Incorrect. All Heaters ON
- Correct

Technical Reference(s): AOP-019

(Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	001 G2.4.31	
	Importance Rating	3.3	

Proposed Question: RO 59

Given the following plant conditions:

- Mode 1, 90% power.
- All systems are in normal alignments.
- Rod Control is in MANUAL.
- The RO has just completed withdrawing control rods four steps for Delta Flux control.
- After the RO releases the IN-HOLD-OUT lever, the following conditions are observed:
 - Rods are stepping, due to an undetermined cause.
 - Tavg is rising. Tref is stable.
 - Pressurizer level is rising.
 - Pressurizer pressure is rising.
 - APP-003-C6, OVERTEMP DELTA T, is illuminated.

Which ONE (1) of the following events is best described by the plant conditions?

- A. Secondary Load Rejection
- B. Rod Ejection
- C. Continuous Rod Insertion
- D. Continuous Rod Withdrawal

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Load reject would have Tref changing
- B. Incorrect. Rod ejection would have pressurizer pressure and level decreasing

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	001 G2.4.31	
	Importance Rating		3.4

Knowledge of annunciators, alarms, and indications, and use of the response instructions

Proposed Question: SRO 59

Given the following plant conditions:

- Mode 1, 90% power.
- All systems are in normal alignments.
- Rod Control is in MANUAL.
- The RO has just completed withdrawing control rods four steps for Delta Flux control.
- After the RO releases the IN-HOLD-OUT lever, the following conditions are observed:
 - Rods are stepping, due to an undetermined cause.
 - Tav_g is rising. T_{ref} is stable.
 - Pressurizer level is rising.
 - Pressurizer pressure is rising.
 - APP-003-C6, OVERTEMP DELTA T, is illuminated.

Which ONE (1) of the following events is described by the above plant conditions, and which procedure will be entered to address the event?

- A. Secondary Load Rejection; enter AOP-015, Turbine Trip or Load Reject.
- B. Rod Ejection; enter PATH-1.
- C. Continuous Rod Insertion; enter AOP-001, Malfunction of the Reactor Control System.
- D. Continuous Rod Withdrawal; enter AOP-001, Malfunction of the Reactor Control System.

Proposed Answer: D

Explanation (Optional):

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	007EK202	
	Importance Rating	2.6	2.8

Knowledge of the interrelations between Reactor Trip and the following: Breakers, relays and disconnects

Proposed Question: Common 60

Which ONE (1) of the following correctly describes how a Reactor Trip signal will open the reactor trip breakers?

- A. UV and Shunt Trip Coils both energize.
- B. UV and Shunt Trip Coils both de-energize.
- C. UV coil energizes, Shunt Trip coil de-energizes.
- D. UV coil de-energizes, Shunt Trip coil energizes.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. UV coil drops out (de-energizes)
- B. Incorrect. Shunt Trip is energize to actuate
- C. Incorrect. UV coil drops out
- D. Correct

Technical Reference(s): SD011 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
Tier #		1	1
Group #		2	2
K/A #		032AK2.01	
Importance Rating		2.7	3.1

Knowledge of the interrelations between the Loss of Source Range Nuclear Instrumentation and the following: Power supplies, including proper switch positions

Proposed Question: Common 61

Reactor startup is in progress.

- IR power indicates 5×10^{-11} amps on both channels.
- Source Range High Flux trip has NOT been blocked.

For the two switch positions shown below, describe the Reactor Protection System response to a blown instrument power fuse on Source Range channel N-31.

SR Level Trip Bypass: NORMAL

SR Level Trip Bypass: BYPASS

- | | |
|--------------------|-----------------|
| A. No Reactor Trip | No Reactor Trip |
| B. Reactor Trip | No Reactor Trip |
| C. No Reactor Trip | Reactor Trip |
| D. Reactor Trip | Reactor Trip |

Proposed Answer: B

Explanation (Optional):

- Incorrect. Unit will trip with switch in normal
- Correct.
- Incorrect. Both answers wrong
- Incorrect. Reactor will not trip with switch in bypass

Technical Reference(s): NIS SD010, section 4.5 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	033AK1.01	
	Importance Rating	2.7	3.0

Knowledge of the operational implications of the following concepts as they apply to the Loss of Intermediate Range Nuclear Instrumentation: Effects of voltage changes on performance

Proposed Question: Common 62

Given the following conditions:

- A Reactor Shutdown is in progress.
- APP-005-B2, N-35 LOSS OF COMP VOLT, is received.
- Intermediate Range Channel N-35 indicates 6×10^{-10} amps.
- Intermediate Range Channel N-36 indicates 1×10^{-11} amps.
- Source Range Channel N-51 indicates 80 CPS.
- Source Range Channel N-52 indicates 90 CPS.

Which ONE (1) of the following correctly describes the action required to obtain Source Range indication?

- Remove the Instrument Power fuses from N-36.
- Remove the control power fuses from N-36.
- Push both 'Source Range Logic Trip Defeat' buttons.
- Push both 'Permissive P-6 Defeat' buttons.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Removing any power from N-36 will not cause N-35 to indicate low enough to remove the P-6 signal
- Incorrect. Removing any power from N-36 will not cause N-35 to indicate low enough to remove the P-6 signal
- Incorrect. The SR Logic Trip defeat buttons are used for SR High flux trip.
- Correct. If compensating voltage is lost, the detector will indicate high. If the detector indicates high, P-6 will be locked in unless it is defeated.

Technical Reference(s): SD010

(Attach if not previously provided)

APP-005-B2

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	038EK301	
	Importance Rating	4.1	4.3

Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Rupture (SGTR): Equalizing pressure on primary and secondary sides of ruptured S/G

Proposed Question: Common 63

Given the following conditions:

- A Steam Generator Tube Rupture has occurred.
- The crew is performing actions contained in PATH-2.

Which ONE (1) of the following describes the reason for reducing RCS pressure to match ruptured SG pressure in PATH-2?

- To eliminate concern for SG overfill and damage to secondary side steam piping.
- To restore RCS inventory and reduce break flow prior to stopping ECCS pumps.
- To minimize the probability of a Pressurized Thermal Shock event when RCS cooldown is commenced.
- To ensure there will be no release of radioactivity through the SG PORVs for the duration of the SGTR.

Proposed Answer: B

Explanation (Optional):

- Incorrect. May not be able to stop overfill if release is large enough
- Correct
- Incorrect. PTS is only a concern if ruptured SG pressure is low. (Also faulted)
- Incorrect. May not be able to stop release if SGTR is large enough

Technical Reference(s): PATH-2 Basis Document (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	054AA102	
	Importance Rating	4.4	4.4

Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW): Manual startup of electric and steam-driven AFW pumps

Proposed Question: Common 64

A reactor trip has occurred due to a Loss of Feedwater.

The following conditions exist:

- Crew has entered FRP-H.1, Response to Loss of Secondary Heat Sink.
- RCS pressure is 2240 psig.
- SG pressure is 1040 psig.
- SG levels are 50% Wide Range, slowly trending down.
- Total AFW flow is 0 gpm.

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

- A. Attempt to start MDAFW or SDAFW pumps manually.
- B. Trip RCPs and establish Bleed and Feed Cooling of the RCS.
- C. Return to PATH-1 for the LOCA in progress.
- D. Feed SGs using Condensate Pumps.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Conditions do not require this action
- C. Incorrect. No LOCA indicated
- D. Incorrect. Action may be taken if AFW cannot be restarted

Technical Reference(s): FRP-H.1 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	058AK3.01	
	Importance Rating	3.4	3.7

Knowledge of the reasons for the following responses as they apply to the Loss of DC Power: Use of DC control power by ED/Gs

Proposed Question: Common 65

Which ONE (1) of the following describes the reason that DC control power is provided for the Emergency Diesel Generators?

The DC distribution system provides power...

- A. necessary to open Air Start Solenoids.
- B. to all indications on the Generator Control Panel.
- C. for developing an electrical output when the EDGs are started.
- D. for Standby Cooling Water Pump "A".

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. EDG air start solenoids supplied DC power, maintain air start system closed
- B. Incorrect. Instrumentation is AC powered
- C. Correct. Field flash
- D. Incorrect. Standby Cooling Water Pump is AC powered

Technical Reference(s): EDG SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	E05EA1.3	
	Importance Rating	3.8	

Ability to operate and / or monitor the following as they apply to Loss of Secondary Heat Sink: Desired operating results during abnormal and emergency situations

Proposed Question: RO 66

The crew is responding to a Loss of Heat Sink per FRP-H.1, Response to Loss of Secondary Heat Sink.

All Steam Generator Wide Range levels are Off-Scale low.

RCS temperature is approximately 578°F and rising slowly.

Which ONE (1) of the following describes the preferred method of initiating Auxiliary Feed flow for these conditions?

- A. Feed at the highest possible rate to reestablish SG inventory and secondary heat sink.
- B. Feed at the highest possible rate to prevent initiation of RCS Bleed and Feed.
- C. Feed at the minimum required flow to prevent excessive cooldown.
- D. Feed at the minimum required flow to establish a controllable cooldown rate and prevent loss of RCS inventory.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Wrong reason; Bleed and Feed established at 26% WR in two S/Gs
- C. Incorrect. Wrong amount of flow
- D. Incorrect. Wrong amount of flow

Technical Reference(s): FRP-H.1 background (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	062AA106	
	Importance Rating		2.9

Ability to operate and / or monitor the following as they apply to Loss of Nuclear Service Water System: Control of flow rates to components cooled by the SWS

Proposed Question: SRO 66

The plant is in Mode 1, 100% RTP.

During recovery from a Loss of Service Water, the crew has entered AOP-014, Component Cooling Water System Malfunction, due to increasing Component Cooling Water temperatures.

- The North Service Water Header in the Auxiliary Building is isolated.
- The crew has restored Service Water pressure to normal.
- CCW Heat Exchanger outlet temperature is 109°F and increasing slowly.
- SFP temperature is 95°F.

Which ONE (1) of the following describes appropriate actions to reduce heat load on the Component Cooling Water System?

- Throttle OPEN CC-775, CC FROM SFP HX BUTTERFLY, to raise SFP temperature to 115°F to 120°F.
- Secure Normal Letdown and place Excess Letdown in service.
- Align Emergency Cooling Water to Charging Pumps.
- Throttle CLOSED CC-775, CC FROM SFP HX BUTTERFLY, to raise SFP temperature to 115°F to 120°F.

Proposed Answer: D

Explanation (Optional):

- Incorrect – Opening CC-775 will increase the heat load on CCW System
- Incorrect – IAW AOP-014 Section D, step 6, this is not an appropriate action
- Incorrect- Action would not affect heat load
- Correct – Throttling closed on CC-775 will reduce the heat load on the CCW System and is an appropriate action IAW AOP-014, Section D, step 6

Technical Reference(s): AOP-014

(Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	060AA102	
	Importance Rating	2.9	3.1

Ability to operate and / or monitor the following as they apply to Accidental Gaseous Radwaste Release: Ventilation system

Proposed Question: Common 67

A leaking Waste Gas Decay Tank has been discovered.

- AOP-009, Accidental Gas Release from a WGDT has been entered.
- The crew is directed to verify that HVE-2A or HVE-2B, AUX BLDG EXHAUST FAN is running.
- Aux Building radiation levels are increasing.

Which ONE (1) of the following describes the basis for this step?

- Allows starting HVE-5A or HVE-5B, AUX BLDG CHARCOAL EXH fans to minimize radioactive release.
- Maximizes air flow through the Aux Bldg to provide dilution of the Waste Gas.
- Ensures operability of R-14 particulate and noble gas monitors for release monitoring.
- Allows R-11 and R-12 to be placed in service for Plant Vent Stack monitoring.

Proposed Answer: A

Explanation (Optional):

- Correct.
- Incorrect. Would not serve this purpose for accidental release
- Incorrect.
- Incorrect. R-11 and R-12 for containment

Technical Reference(s): AOP-009 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	E11EK2.2	
	Importance Rating	3.9	4.3

Knowledge of the interrelations between the Loss of Loss of Emergency Coolant Recirculation 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 68

Which ONE (1) of the following is true concerning depressurizing the RCS IAW EPP-15, Loss of Emergency Coolant Recirculation?

- A. To minimize RCS leakage, depressurize the RCS until Pressurizer level is > 71% **OR** RCS Subcooling is between 35° F and 45° F.
- B. To increase SI Injection flow, depressurize the RCS until Pressurizer level is > 90% **OR** RCS Subcooling is between 25° F and 35° F.
- C. To prevent nitrogen injection from the SI Accumulators, depressurize the RCS until Pressurizer level is >71% **OR** RCS Subcooling is between 35° F and 45° F.
- D. To allow RHR to be placed in service, depressurize the RCS until Pressurizer level is >90% **OR** RCS Subcooling is between 25° F and 35° F.

Proposed Answer: A

Explanation (Optional):

- A. Correct. The depressurization is performed to decrease leakage, therefore decreasing makeup requirements
- B. Incorrect. SI injection flow may not increase because there may be no water source
- C. Incorrect. To minimize RCS leakage, not to prevent nitrogen injection from SI Accumulators
- D. Incorrect. RHR will not be placed in service until after the cooldown and depressurization are performed, later in the procedure

Technical Reference(s): EPP-015, step 39 basis (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	2	2
	K/A #	E11EA1.1	
	Importance Rating	3.9	4.0

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 69

Given the following plant conditions:

- The reactor tripped 90 minutes ago.
- A loss of emergency coolant recirculation has occurred.
- The crew is performing actions of EPP-15, Loss of Emergency Coolant Recirculation.
- RCS subcooling is 40°F.
- RVLIS is 60% dynamic range.
- "C" RCP is running.
- "A" SI pump is running.
- SI flow rate is 250 gpm.

Which ONE of the following actions should the operator take IAW EPP-15?

- Throttle SI flow to minimum required.
- Start "C" SI pump to maximize SI flow.
- Increase RCS makeup flow with Charging or align another SI suction source.
- Stop "A" SI pump because one RCP is available.

Proposed Answer: A

Explanation (Optional):

- Correct. Follow the curve for maintaining adequate core cooling
- Incorrect. Do not start another SI pump. Insufficient suction
- Incorrect. Core Cooling is being maintained as evidenced by adequate subcooling. Increasing makeup applies to Suction source
- Incorrect. Do not stop SI pumps in EPP-15

Technical Reference(s): EPP-15 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	3	2
	K/A #	065AK304	
	Importance Rating	3.0	3.2

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 70

A loss of Instrument Air has occurred. The crew is performing actions of AOP-017, Loss of Instrument Air.

Instrument Air pressure is 70 psig and trending down.

Which ONE (1) of the following describes the preferred method of cross-connecting Station Air to Instrument Air, and the reason it is preferred?

- A. Open SA-5, Station Air to Instrument Air cross-connect, to slow down the rate of pressure loss.
- B. Open SA-5, Station Air to Instrument Air cross-connect, to ensure that there is a filtered connection to minimize oil contamination of the Instrument Air System.
- C. Open Station Air to Instrument Air cross-connect bypass filter isolation valves SA-220 and SA-221, to slow down the rate of pressure loss.
- D. Open Station Air to Instrument Air cross-connect bypass filter isolation valves SA-220 and SA-221, to ensure that there is a filtered connection to minimize oil contamination of the Instrument Air System.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Only use SA-5 as a backup
- B. Incorrect. Only use SA-5 for backup, and reason is wrong
- C. Incorrect. Reason is wrong
- D. Correct

Technical Reference(s): AOP-017 and background (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
	K/A #	E15EK2.1	
	Importance Rating	2.8	2.9

Knowledge of the interrelations between Containment Flooding and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features

Proposed Question: Common 71

Given the following conditions:

- The crew has transitioned from EPP-4, Reactor Trip Response, to FRP-J.2, Response to Containment Flooding.
- The crew is performing FRP-J.2 due to flooding in the CV.
- A leak in the Fire Water System is suspected.
- The crew shuts RCP SPRINKLER ISOLATION Valves FP-256 & FP-258.

Which ONE (1) of the following components will be isolated?

- CV hose station header and RCP Preaction Sprinkler Systems.
- CV Electrical Penetration Preaction Sprinkler System and Aux Building hose stations.
- Radwaste Building Sprinkler System and RCP Preaction Sprinkler System.
- RCP Preaction Sprinkler Systems and Aux Building hose stations.

Proposed Answer: A

Explanation (Optional):

- Correct
- Incorrect. Electrical Penetrations and aux building hose stations isolated by different valves
- Incorrect. Radwaste Bldg isolated from different valves
- Incorrect. Aux Bldg isolated by different valves

Technical Reference(s): FRP-J.2, step 5 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	015K2.01	
	Importance Rating	3.3	

Knowledge of electrical power supplies to the following: Nuclear Instrumentation System; NIS channels, components, and interconnections

Proposed Question: RO 72

Given the following conditions:

- A plant startup is in progress with reactor power at 4%.
- The Main Generator is being paralleled to the grid.
- Power is lost to Instrument Bus 2.

Which ONE (1) of the following describes the plant response for loss of power to Instrument Bus 2?

- Reactor Trip due to failed Source Range channel.
- Reactor Trip due to failed Intermediate Range channel.
- Turbine Reference Runback due to Power Range failure.
- No effect because Reactor Power is less than the P-10 setpoint.

Proposed Answer: B

Explanation (Optional):

- Incorrect. SR trips blocked > P6
- Correct
- Incorrect. Generator not connected to grid
- Incorrect. Less than P10, IR 1 out of 2 trip logic

Technical Reference(s): Logic CP300-5379-2755 (Attach if not previously provided)
NIS SD010

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	006A2.13	
	Importance Rating		4.2

Ability to (a) predict the impacts of the following on the Emergency Core Cooling System (ECCS) and (B) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Inadvertent SIS Actuation

Proposed Question: SRO 72

Given the following conditions:

- A Reactor Trip and Safety Injection have occurred.
- The crew is performing actions of PATH-1. The following conditions exist:
 - SPDS is reset. STA is monitoring CSF Status Trees.
 - RCS Pressure is 2200 psig and stable.
 - Pressurizer level is 22% and stable.
 - SG Narrow Range levels are 25% and stable.
 - SG Pressures are 1040 psig and stable.
 - RCS temperature is 547 deg F and stable.

Which ONE (1) of the following describes the appropriate procedure for mitigation of the event in progress?

- A. EPP-4, Reactor Trip Response.
- B. EPP-7, SI Termination.
- C. EPP-8, Post LOCA Cooldown and Depressurization.
- D. GP-004, Post Trip Stabilization.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. SI has actuated
- B. Correct

- C. Incorrect. No LOCA indicated
- D. Incorrect. Must transition to EPP-7 prior to GP-004.

Technical Reference(s): PATH-1, EPP-7 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	017K4.03	
	Importance Rating	3.1	

Knowledge of In-Core Temperature Monitor (ITM) System design feature(s) and or interlock(s) which provide for the following:
Range of temperature indication

Proposed Question: RO 73

Which ONE (1) of the following is the highest temperature that you would expect the Incore Thermocouples used in the ICCM System to be valid?

- A. 1000° F
- B. 1200° F
- C. 2300° F
- D. 2850° F

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Temperatures expected if degraded core cooling condition existed
- B. Incorrect. Temperature for entry to FRP-C.1
- C. Correct.
- D. Incorrect. Core melt by this temperature

Technical Reference(s): ICCM SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	006K1.03	
	Importance Rating		4.3

Knowledge of the physical connections and/or cause-effect relationship between ECCS and the following: RCS

Proposed Question: SRO 73

The following conditions exist:

- SI-863A and B closed (RHR LOOP RECIRC)
- SI-864A and B open (RWST DISCHARGE)
- SI-866A and B closed (LOOP HOT LEG INJ)
- SI-867A and B open (BIT INLET)
- SI-868A, B, and C open (HIGH HEAD TO LOOP COLD LEG ISOL)
- SI-869 closed (LOOPS 2 and 3 HIGH HEAD INJECTION SHUTOFF)
- SI-870A and B closed (BIT OUTLET)

Which ONE (1) of the following describes the current lineup of the SI system?

- A. Normal at power lineup
- B. Injection phase from ECCS sump
- C. Cold Leg recirculation phase from RHR pumps
- D. Long term Hot Leg recirculation phase from the RHR pumps

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Requires 870s open
- C. Incorrect. Requires 864s closed
- D. Incorrect. Requires 863 open, 866 open, and 864s and 870s closed

Technical Reference(s): ECCS SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	022K101	
	Importance Rating	3.5	

Knowledge of the physical connection and/or cause-effect relationship between the Containment Cooling System and the following:
SWS/Cooling system

Proposed Question: RO 74

Which ONE (1) of the following describes the location where the sample lines for R-16 (CV HVH COOLING WATER) tie into the Service Water System?

- A. Downstream of the HVH unit discharge isolation valves, outside of the CV.
- B. Downstream of the HVH unit discharge isolation valves, inside the CV.
- C. Upstream of the HVH unit discharge isolation valves, outside of the CV.
- D. Upstream of the HVH unit discharge isolation valves, inside of the CV.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Upstream
- B. Incorrect. Upstream
- C. Correct
- D. Incorrect. Outside CV

Technical Reference(s): SD-004 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>3</u>
	K/A #	<u>076G2.2.6</u>	_____
	Importance Rating	_____	<u>3.3</u>

Knowledge of the process for making changes in procedures as described in the safety analysis report.

Proposed Question: SRO 74

OST 302-1, Service Water System Component Test Train 'A', is in progress.

The operator determines that the current revision of the procedure may contain steps that would result in equipment damage. He stops performance of the OST and informs the CRSS.

Which ONE (1) of the following describes the action required prior to reinitiating OST 302-1?

- A. A temporary procedure change or permanent revision must be initiated.
- B. N/A the applicable steps and document the action in the 'comments' section of the OST.
- C. Obtain the approval of the SSO IAW 10CFR50.54(x) and complete the OST using the correct step sequence.
- D. The STA must initial the applicable steps that will not be performed as written and document the action in the 'comments' section of the OST.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Only for non-intent changes
- C. Incorrect. Only in emergencies
- D. Incorrect. Not for intent changes

Technical Reference(s): PRO-NGGC-0200 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	022 G2.4.2	
	Importance Rating	3.9	

Knowledge of system setpoints, interlocks, and automatic actions associated with EOP entry conditions

Proposed Question: RO 75

Given the following plant conditions:

- Mode 1 at 100% RTP.
- 'A' EDG is inoperable.
- The reactor trips on OT DELTA T.
- SI actuates on Low Pressurizer pressure.
- CV pressure is 6 psig.
- Operators are performing their PATH-1 Immediate Actions when the Startup Transformer is lost.
- Service Water Header pressure is 25 psig.

Which ONE (1) of the following describes the operation of the Service Water Booster Pumps (SWBP)?

- A. 'A' SWBP will automatically start with the SI sequencer.
- B. 'A' SWBP will not automatically start until suction pressure is >30 psig.
- C. 'B' SWBP will automatically start with the SI sequencer.
- D. 'B' SWBP will not automatically start until suction pressure is >30 psig.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Inop power source for 'A' SWBP
- B. Incorrect. Inop power source for 'A' SWBP
- C. Correct.

D. Incorrect. Suction pressure does not apply for safeguards start

Technical Reference(s): SD 004 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	_____
	K/A #	G2.1.4	_____
	Importance Rating	_____	3.4

Knowledge of shift staffing requirements.

Proposed Question: SRO 75

The plant is in Mode 1.

You are the on-shift CRSS. Control Room staffing is currently at the MINIMUM required.

The Off-Going RO has been on shift for 12 hours. His relief has called in with car trouble and will be 1 hour late.

Which ONE (1) of the following describes how turnover for the RO position will be performed?

- A. The Off-Going RO must turn over to the On-Coming BOP. The RO position may be vacant for up to 2 hours.
- B. The Off-Going RO must remain on shift until his relief or another qualified designated relief assumes the RO position.
- C. The Off-Going RO must turn over to the On-Coming CRSS. The RO position may be vacant for up to 2 hours.
- D. The Off-Going RO may turn over to any On-Coming qualified relief unless he is assigned duties as Emergency Communicator or Fire Brigade.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Not emergency, not at turnover
- B. Correct.
- C. Incorrect. Same reason as A
- D. Incorrect. RO not assigned Fire Brigade or Communicator duties

Technical Reference(s): ITS 5.2.2

(Attach if not previously provided)

OMM-001-2 section 8.1.4

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G 2.1.7	
	Importance Rating		4.4

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

Proposed Question: SRO 76

Given the following conditions:

- A plant startup is in progress IAW GP-005, Power Operation.
- Reactor Power has been stabilized.
- Power Range NIs indicate approximately 29%.
- Calorimetric calculation indicates approximately 26%.
- RCS Loop Delta-T indication is approximately 17 deg F.

Which ONE (1) of the following describes how the crew should proceed in GP-005?

- Continue with the plant startup.
- Hold power stable, contact plant management for further instruction.
- Commence a plant shutdown based on invalid NI indication.
- Trip the reactor, and enter PATH-1.

Proposed Answer: A

Explanation (Optional):

- Correct. All indications are within 5%, which is acceptable. Delta T indicates approximately 30% power
- Incorrect. Indications are within 5%
- Incorrect. Not required in procedure
- Incorrect. Not required in procedure

Technical Reference(s): GP-005

(Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	_____
	K/A #	G 2.1.32	_____
	Importance Rating	_____	3.8

Ability to explain and apply all system limits and precautions.

Proposed Question: SRO 77

The plant is in Mode 6. Core Alterations are in progress.

Source Range Channel N-32 indication fails low. Channels N-51 and N-52 are OPERABLE

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

- A. Stop Core Alterations. Do not resume until SR Channel N-32 is returned to service.
- B. Stop Core Alterations. Do not resume until the Audible count rate is selected to N-52. N-31 indication must be logged every 30 minutes.
- C. Core Alterations may continue provided either N-51 or N-52 indications are logged every 30 minutes and the Audible count rate is selected to N-31.
- D. Core Alterations may continue provided the Audible count rate is selected to N-51.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. N32 not required if other indication available
- B. Incorrect. Cannot select audible count rate to N52
- C. Correct
- D. Incorrect. Cannot select to N51

Technical Reference(s): TS section 3.9, GP-010 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	061K6.01	
	Importance Rating	2.5	

Knowledge of the effect of a loss or malfunction on the following will have on the Auxiliary / Emergency Feedwater (AFW) System:
Controllers and positioners

Proposed Question: RO 78

With the plant at 100% power, the SDAFW pump steam supply valve from SG 'B', V1-8B, has been locally isolated and power to the valve has been cleared.

If an auto start signal is received, how will the operation of the pump be affected?

The SDAFW pump will...

- Not start, since V1-8B will not open. The permissive for opening the SDAFW pump discharge valve, FCV-6416, on an auto start signal cannot be obtained.
- Start, but not enough steam will be supplied to the turbine to operate it at its normal speed while supplying full water flow.
- Start and operate at rated speed while supplying full water flow to all steam generators.
- Start and operate at rated speed while supplying full water flow to only 'A' and 'C' steam generators.

Proposed Answer: C

Explanation (Optional):

- Incorrect. Pump will start, 6416 unaffected
- Incorrect. Only 1 valve required for start
- Correct
- Incorrect. All SGs will be fed

Technical Reference(s): SD-042 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	_____
	K/A #	<u>G2.2.25</u>	_____
	Importance Rating	_____	<u>3.7</u>

Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

Proposed Question: SRO 78

Which ONE (1) of the following describes ONLY components assumed to operate at their setpoints to prevent exceeding the Technical Specification safety limit on RCS pressure?

- A. Pressurizer PORVs and Main Steam Safety Valves.
- B. Pressurizer Safety Valves and Main Steam Safety Valves.
- C. Pressurizer PORVs and Main Steam Line PORVs.
- D. Pressurizer Safety Valves and Main Steam Line PORVs.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. PORVs not assumed
- B. Correct
- C. Incorrect. PORVs not assumed
- D. Incorrect. PORVs not assumed

Technical Reference(s): TS Basis Pg B 2.0.6-2.0.7 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	071A4.26	
	Importance Rating	3.1	

Ability to manually operate and/or monitor in the control room: Waste Gas Disposal System (WGDS); Authorized waste gas release, conducted in compliance with radioactive gas discharge permit

Proposed Question: RO 79

A gaseous waste discharge is in progress.

Which ONE (1) of the following ensures the release will be in compliance with the discharge permit?

- A. RCV-014, Waste Gas Decay Tank release isolation valve, is set at or below its determined value.
- B. PCV-1040, Pressure Reducing Release discharge valve, is set at or below its determined value.
- C. PCV-1027, Cover Gas Pressure Control Valve, is aligned to the WGDT to be released.
- D. The Waste Gas Compressors are isolated for the duration of the discharge.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Valve maintains constant flow rate
- C. Incorrect. WGDT to be released is isolated
- D. Incorrect. Compressors are not isolated

Technical Reference(s): SD 023 (Attach if not previously provided)

OP-706

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	_____
	K/A #	<u>G2.2.32</u>	_____
	Importance Rating	_____	<u>3.3</u>

Knowledge of the effects of alterations on core configuration.

Proposed Question: SRO 79

The plant is in Mode 6. Fuel movement is in progress IAW FMP-019, Fuel and Insert Shuffle.

Which ONE (1) of the following describes when a 1/M plot is required ?

- A. After CRDM latching and unlatching
- B. During the upper internals lift
- C. After each fuel assembly movement during core reload
- D. During the Reactor Vessel Head lift

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Only fuel moves
- B. Incorrect. Only fuel moves
- C. Correct
- D. Incorrect. Only fuel moves

Technical Reference(s): FMP-019 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	002K1.04	
	Importance Rating	2.8	

Knowledge of the physical connections and/or cause-effect relationships between Reactor Coolant System (RCS) and the following:
RCS vent system

Proposed Question: RO 80

Which ONE (1) of the following describes the purpose of the RCS High Point Vent Isolation Valves, RC-567 – RC-572?

- A. Used in normal and emergency operations to vent the reactor vessel head or the pressurizer to the PRT or containment
- B. Used in emergencies to vent the RCS loop hot legs to the pressurizer or PRT during interrupted circulation of the RCS
- C. Used to vent the reactor vessel head during plant startup prior to RCP operation
- D. Used to vent the RCS loops during plant startup in conjunction with RCP operation

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. Does not vent loops
- C. Incorrect. Manual valves in loops are used for this operation
- D. Incorrect. Does not vent loops

Technical Reference(s): FRP-C.1, SD-001 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	_____
	K/A #	<u>G2.3.8</u>	_____
	Importance Rating	_____	<u>3.2</u>

Knowledge of the process for performing gaseous radioactive releases

Proposed Question: SRO 80

Preparations are in progress for release of a Waste Gas Decay Tank (WGDT). In accordance with EMP-022, 'Gaseous Waste Release Permits', which ONE (1) of the following is a responsibility of the SSO?

- A. Approval of all sections of the Release Permit after the release is complete.
- B. Approval of Part II (Radiation Monitoring Info) of the Release Permit prior to initiating the release.
- C. Contacting the Operations Manager prior to initiating any gaseous release.
- D. Contacting the E&RC Supervisor prior to initiating any gaseous release.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. SSO only approves Part II
- B. Correct
- C. Incorrect. Action not required IAW EMP-022
- D. Incorrect. Action not required IAW EMP-022

Technical Reference(s): EMP 022, Attachment 10.3 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	2
	Group #	2	2
	K/A #	035A2.02	
	Importance Rating	4.2	4.4

Ability to (a) predict the impacts of the following on the Steam Generating System (SGS) and (B) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Reactor Trip/Turbine Trip

Proposed Question: SRO 31 RO 81 Shows up twice in master worksheet

Given the following conditions:

- The reactor has tripped. SI is initiated. All equipment has started as required.
- The crew is performing PATH-1.
- RCS Pressure is 1250 psig.
- Containment pressure is 6 psig.
- Pressurizer level is off-scale low.
- SG pressures are approximately 1000 psig.
- All S/G NR levels are 20%.

Based on the above conditions, which ONE (1) of the following must be performed in PATH-1?

- A. Start SDAFW pump.
- B. Verify Containment Isolation Phase 'A'.
- C. Verify Containment Spray Actuation.
- D. Verify Containment Isolation Phase 'B'.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Indication does not require SDAFW
- B. Correct. Above CIA/MSLI pressure in ctmt
- C. Incorrect. Not above CIB pressure (Also Spray Setpoint)
- D. Incorrect. Not above CIB pressure

Technical Reference(s): PATH-1 (Attach if not previously provided)
SD-006

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	3
	Group #	_____	_____
	K/A #	2.4.27	_____
	Importance Rating	_____	3.5

Knowledge of fire in the plant procedure.

Proposed Question: SRO 81

Which ONE (1) of the following requires Fire Brigade Team response?

- A. Any fire alarm inside the Fire Brigade response area
- B. Any fire alarm received on the Fire Alarm Console
- C. Halon System actuation
- D. Welding in the vicinity of energized electrical equipment

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Fire Brigade response not required unless alarms are in 2 trains. FPAO would respond to single alarms
- B. Incorrect. Same reason as A
- C. Correct. Any actuation
- D. Incorrect. A Fire Watch would be available

Technical Reference(s): FP-001 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	034K4.01	
	Importance Rating	2.6	

Knowledge of Fuel Handling Equipment System (FHES) design feature(s) and or interlock(s) which provide for the following: Fuel protection from binding and dropping

Proposed Question: RO 82

Given the following conditions:

- In Mode 6 for refueling.
- Core offload to the Spent Fuel Pool is in progress.
- The CV Manipulator operator has just removed a fuel assembly at core location H-8 and is in transit to the CV upender.
- The CV Manipulator operator accidentally places the gripper switch to the 'DISENGAGE' position before the assembly is lowered into the CV upender.

Which ONE (1) of the following describes the results of this action?

The fuel assembly will...

- be released from the manipulator gripper.
- not be released due to the 'gripper-weight' interlock.
- not be released due to the 'gripper tube up' interlock.
- not be released due to the 'bridge-trolley' interlock

Proposed Answer: B

Explanation (Optional):

- Incorrect. Cannot be released with weight on the tool
- Correct.
- Incorrect. Wrong interlock for release of weight
- Incorrect. Not an interlock for fuel, but for the trolley and carriage

Technical Reference(s): FHS SD (Attach if not previously provided)

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

Ability to determine and interpret the following: Required actions if more than one rod is stuck or inoperable

Proposed Question: SRO 82

The plant is stable in Mode 1 at 100% power.

Control Bank "D" indicates the following:

- Bank Demand Position = 136 inches
- Control Rod H04 = 134 inches
- Control Rod H08 = 145 inches
- Control Rod H12 = 125 inches
- Control Rod D08 = 120 inches
- Control Rod M08 = 152 inches

The crew is performing actions contained in AOP-001, Malfunction of the Reactor Control System.

Which ONE (1) of the following describes the action(s) required by ITS and AOP-001?

- A. Immediately trip the reactor and emergency borate the RCS within 1 hour.
- B. Reduce reactor power to less than 80% thermal power within 1 hour.
- C. Restore both control rods to within alignment within 2 hrs.
- D. Verify SDM is within the limits provided in the COLR within 1 hour.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Trip not required
- B. Incorrect. Full shutdown required
- C. Incorrect. Required to be in MODE 3 in 6 hrs. One hour to correct for one rod misaligned
- D. Correct – More than one rod (D08 & M08) > 15 inches from Bank Demand . Verify SDM within limits of the COLR within 1 hr and be in MODE 3 within 6 hours

Technical Reference(s): ITS 3.1.4.d (Attach if not previously provided)

AOP-001

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	041K6.03	
	Importance Rating	2.7	

Knowledge of the effect of a loss or malfunction on the following will have on the Steam Dump System (SDS) and Turbine Bypass Control: Controller and positioners, including ICS, S/G, CRDS

Proposed Question: RO 83

Given the following conditions:

- The plant is at 100% power.
- Rod Control is in MANUAL.
- All other controls are in AUTO.
- A turbine control valve failure results in a load rejection.
- Tavg – Tref deviation indicates 10°F.
- APP-006-F5, STEAM DUMP ARMED, is illuminated.

Which ONE (1) of the following describes Steam Dump response?

- Three Steam Dumps will modulate open.
- Three Steam Dumps will trip open.
- Three Steam Dumps will trip open. Two additional Steam Dumps will modulate open.
- Five Steam Dumps will trip open.

Proposed Answer: A

Explanation (Optional):

- Correct. 5-11.6 deg F, 3 dumps modulate
- Incorrect. 3 valves will not trip open until 11.6 deg mismatch
- Incorrect. 2 additional valves begin modulation when first 3 trip open
- Incorrect. Not enough temperature mismatch

Technical Reference(s): Steam Dump SD P. 8 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	015/017AA2.10	
	Importance Rating		3.7

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump (RCP) Malfunctions (Loss of RC Flow):
When to secure RCPs on loss of cooling or seal injection

Proposed Question: SRO 83

Given the following conditions:

- The plant is operating at 42% power.
- A Loss of Component Cooling Water has occurred.
- 'A' RCP Motor Bearing temperature is 202°F and rising slowly.

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

- Continue to monitor 'A' RCP Bearing temperatures. If temperature exceeds 210°F then stop 'A' RCP and go to PATH-1.
- Stop 'A' RCP. Perform action required by Technical Specification 3.4.4, RCS Loops-Modes 1 and 2.
- Trip the reactor, stop 'A' RCP, and go to PATH-1.
- Stop 'A' RCP. Perform a plant shutdown IAW GP-006.

Proposed Answer: C

Explanation (Optional):

- Incorrect. Trip criteria exceeded
- Incorrect. Greater than P-8, cannot trip RCP without tripping reactor first
- Correct
- Greater than P-8

Technical Reference(s): AOP-014, Section D, Step 3 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	029EA1.15	
	Importance Rating		3.9

Ability to operate or monitor the following as they apply to the ATWS: AFW

Proposed Question: SRO 84

Given the following conditions:

- An ATWS has occurred.
- FRP-S.1 has been entered.
- CV pressure is 1.9 psig and stable.
- SG Levels indicate as follows:
 - 'A' SG NR level 15%
 - 'B' SG NR level 15%
 - 'C' SG NR level 19%

Based on the above plant conditions which ONE (1) of the following IAW FRP S.1 describes the requirements to maintain an adequate heat sink?

- A. 300 gpm AFW flow
- B. 325 gpm AFW flow
- C. Control AFW flow to maintain SG NR levels between 18-50%.
- D. Control AFW flow to maintain SG NR levels between 8-50%.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. No absolute value. Inventory is adequate
- B. Incorrect. No absolute value. Inventory is adequate
- C. Incorrect. Adverse numbers not required
- D. Correct

Technical Reference(s): FRP-S.1 step 11 & 12 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	_____
	Group #	_____	_____
	K/A #	G2.2.12	_____
	Importance Rating	3.0	_____

Knowledge of surveillance procedures.

Proposed Question: RO 85

You have been directed to perform a Surveillance Test (OST) that is part of a Post Maintenance Test (PMT).

Which ONE (1) of the following describes a condition where a step in the OST may be marked 'N/A'?

- A. To change the conditions or intent of the test.
- B. A precaution or limitation of a test is not applicable.
- C. To designate components that are not being used as part of the PMT.
- D. To identify required components that are out of service during the performance of a test.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Using N/A to change conditions or ignore precautions is forbidden.
- B. Incorrect. Using N/A to change conditions or ignore precautions is forbidden.
- C. Correct. N/A should be used when performing partial OSTs to designate components that will not be used in the OST
- D. Incorrect. If required equipment is OOS, the OOS should be marked next to the step as well as action taken in the OST 'comments' section

Technical Reference(s): OMM-015, section 8.2 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	040AA2.03	_____
	Importance Rating	_____	4.7

Ability to determine and interpret the following as they apply to the Steam Line Rupture: Difference between steam line rupture and LOCA

Proposed Question: SRO 85

Given the following conditions:

- Reactor Trip and Safety Injection have occurred.
- RCS Pressure is 1600 psig and DECREASING.
- Pressurizer level is off-scale low.
- Tav_g is 500°F and DECREASING.
- Containment Pressure is 3 psig and INCREASING.
- SG 'A' Pressure is 620 psig and DECREASING.
- SG 'B' and 'C' Pressures are 900 psig and STABLE.

Which ONE (1) of the following procedures will be used immediately following transition from PATH-1?

- A. EPP-7, SI Termination.
- B. EPP-8, Post LOCA Cooldown and Depressurization.
- C. EPP-11, Faulted Steam Generator Isolation.
- D. EPP-4, Reactor Trip Response.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Do not meet pressure criteria and event is still in progress
- B. Incorrect. Do not have a LOCA. RCS is following SG saturation temp
- C. Correct

D. Incorrect. SI is actuated

Technical Reference(s): EPP-11 Entry (Attach if not previously provided)

PATH-1

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

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: RO 86

AOP-013, 'Fuel Handling Accident', will require the control room operator to perform which ONE (1) of the following actions?

- A. Align the PURGE/REFUEL switch to the REFUEL position.
- B. Stop Containment Ventilation fans HVH-1, 2, 3, and 4.
- C. Place HVE-3 and HVE-4 (CV Iodine Removal) control switches to the DOME VENT position.
- D. Place HVE-3 and HVE-4 control switches to the PREPURGE position.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect.
- B. Incorrect. May have to start
- C. Incorrect. Would not operate fans for accident
- D. Correct.

Technical Reference(s): AOP-013 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	040 G2.4.35	_____
	Importance Rating	_____	3.5

Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.

Proposed Question: SRO 86

You are the CRSS on shift during a Main Steam Line Break.

The crew is performing Supplement G IAW EPP-011, Faulted Steam Generator Isolation.

Which ONE (1) of the following local actions will you direct to be performed IAW Supplement G?

- A. Open breaker for V2-6A, Feedwater Header Section valve.
- B. Open breaker for V1-8A, SDAFW Steam Shutoff valve.
- C. Open MS-20, SG 'A' Bypass Drain & Warmup Line to AFW pump.
- D. Close breaker for V2-14A, SDAFW pump to SG 'A'.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Procedure does not direct operator to perform this action.
- B. Correct.
- C. Incorrect. Procedure directs operator to close MS-20.
- D. Incorrect. Procedure directs operator to open breaker V2-14A

Technical Reference(s): Supplement G (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	_____
	Group #	_____	_____
	K/A #	G2.4.8	_____
	Importance Rating	3.0	_____

Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.

Proposed Question: RO 87

The reactor is tripped.

The crew is performing actions contained in PATH-1.

Which ONE (1) of the following describes the concurrent use restrictions on AOP-017, Loss of Instrument Air?

- A. Concurrent use of AOP-017 is not allowed during EOP usage.
- B. AOP-017 may only be used concurrently with actions of PATH-1.
- C. AOP-017 may be used concurrently with EOPs only if no RED or ORANGE CSF status trees exist.
- D. AOP-017 may be used concurrently as necessary under all conditions of EOP use.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. May be used if no red or orange paths exist
- B. Incorrect. May be used in conjunction with other procedures
- C. Correct.
- D. Incorrect. May not be used when red or orange path exists

Technical Reference(s): OMM-022 section 8.3.14 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	055EK3.02	_____
	Importance Rating	_____	4.6

Knowledge of the reasons for the following as they apply to the Station Blackout: Reasons for actions contained in EOP

Proposed Question: SRO 87

EPP-1, Loss of All AC Power, specifies an RCS cooldown using Steam Line PORVs.

Which ONE (1) of the following is the basis for stopping the SG depressurization at 240 psig?

Additional depressurization may...

- A. cause voiding in the reactor vessel head.
- B. limit natural circulation performance due to reduced pressure.
- C. allow nitrogen to inject from the safety injection accumulators.
- D. result in pressurized thermal shock.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Depressurization results in cooldown. No voiding expected
- B. Incorrect. Voiding would interrupt natural circulation. No voiding occurs
- C. Correct.
- D. Incorrect. PTS would not result when cooldown and depressurization are performed in EPP-1

Technical Reference(s): EPP-1 Basis Document (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	040AK3.02	
	Importance Rating	4.4	

Knowledge of the reasons for the following responses as they apply to the Steam Line Rupture: ESFAS Initiation

Proposed Question: RO 88

Which ONE (1) of the following describes the reason for Safety Injection actuation during a Main Steam Line Break (MSLB)?

- A. Maintains RCS pressure to prevent loss of subcooling during the RCS cooldown.
- B. Ensures borated water is added to the RCS to offset the positive reactivity added during the RCS cooldown.
- C. Minimizes the probability of a Pressurized Thermal Shock event by limiting the pressure transient on the RCS.
- D. Ensures Main Steam Line Isolation in the event of a MSLB inside Containment.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. MSLB will not lose subcooling
- B. Correct
- C. Incorrect. SI increases chance of PTS because pressure will be high, and heatup will squeeze the RCS
- D. Incorrect. MSLI will go on Containment pressure, but not from SI

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

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	E01EA2.1	_____
	Importance Rating	_____	4.0

Ability to determine and interpret the following as they apply to Rediagnosis: Facility conditions and selection of appropriate procedures during abnormal and emergency operations

Proposed Question: SRO 88

Given the following conditions:

- The plant has tripped. Safety Injection has actuated.
- The crew has entered EPP-7, SI Termination.
- RCS temperature is stable.
- RO reports 'A' SG level is increasing with feedwater isolated.

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

- A. Complete EPP-7 unless SI reinitiation is required.
- B. Return to PATH-1, Entry Point 'A'.
- C. Return to PATH-1, Entry Point 'C'.
- D. Go to PATH-2, Entry Point 'J'.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Foldout B requires transition
- B. Incorrect. Wrong Transition
- C. Incorrect. Wrong transition
- D. Correct.

Technical Reference(s): Foldout B (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	076AA2.02	
	Importance Rating	2.8	

Ability to determine and interpret the following as they apply to High Reactor Coolant Activity: Corrective actions required for high fission product activity in RCS

Proposed Question: RO 89

Given the following conditions:

- The plant is operating at 100% RTP.
- PROCESS MONITOR HI RADIATION annunciator is illuminated.
- R-9, Letdown Line Area Monitor, is in alarm.

Which ONE (1) of the following describes the outside assistance required to implement the requirements of AOP-005, 'Radiation Monitoring System'?

- E&RC personnel perform surveys and sample the RCS.
- Local operator conducts inspections for leakage.
- Local operator closes CP liquid waste isolation valve, RCV-10549.
- E&RC collects gas samples.

Proposed Answer: A

Explanation (Optional):

- Correct. Action required
- Incorrect. Action not required IAW AOP-005 for R-9 alarm
- Incorrect. Action not required IAW AOP-005 for R-9 alarm
- Incorrect. Action not required IAW AOP-005 for R-9 alarm

Technical Reference(s): AOP-005 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	011EA2.14	_____
	Importance Rating	_____	4.0

Ability to determine or interpret the following as they apply to a Large Break LOCA: Actions to be taken if PTS limits are violated

Proposed Question: SRO 89

Given the following conditions:

- A Large Break LOCA has occurred.
- The crew has performed actions contained in PATH-1.
- SPDS has just been reset.
- CSF Status Trees indicate the following:
 - Containment RED
 - Integrity RED
 - Core Cooling ORANGE
 - Inventory YELLOW

Which ONE (1) of the following procedures will be entered next?

- A. FRP-C.1, Response to Inadequate Core Cooling.
- B. FRP-C.2, Response to Degraded Core Cooling.
- C. FRP-P.1, Response to Imminent Pressurized Thermal Shock.
- D. FRP-J.1, Response to High Containment Pressure.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Requires Core Cooling red path
- B. Incorrect. Not highest priority

C. Correct

D. Incorrect. Lower priority red

Technical Reference(s): OMM-22 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	2	_____
	K/A #	009EA2.02	_____
	Importance Rating	3.5	_____

Ability to determine and interpret the following as they apply to the Small Break LOCA: Possible Leak Paths

Proposed Question: RO 90

An automatic Reactor Trip and Safety Injection have occurred as a result of lowering RCS pressure. The operators note the following conditions:

- Pressurizer pressure dropping prior to and following the SI
- RCS average temperature stable prior to and following the SI
- Pressurizer level rising prior to the SI and rising following the SI

Initially, which ONE (1) of the following accidents would result in these conditions?

- A. Steamline break
- B. A leaking S/G PORV
- C. Stuck open pressurizer safety valve
- D. Small break on the RCS Cold Leg

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. RCS temp would change
- B. Incorrect. RCS temp would change
- C. Correct
- D. Incorrect. Pressurizer level would drop

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

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	E08EK3.2	
	Importance Rating		4.0

Knowledge of the reasons for the following responses as they apply to Pressurized Thermal Shock: Normal, abnormal, and emergency operating procedures associated with Pressurized Thermal Shock

Proposed Question: SRO 90

Given the following conditions:

- The reactor has tripped. Safety Injection and Containment Spray have actuated.
- RCS pressure is 20 psig.
- RHR flow is 3000 gpm.
- Containment Sump level is rising rapidly.
- SG pressures are approximately 680 psig and stable.

Based on the above plant conditions which ONE (1) of the following states the basis for the procedure transition from FRP-P.1, Response to Imminent Pressurized Thermal Shock, back to PATH 1?

- A. Pressurized Thermal Shock is not a serious concern during a Large Break LOCA.
- B. A Small Break LOCA has priority over Pressurized Thermal Shock concerns.
- C. Faulted SG isolation must occur prior to transition to an FRP.
- D. Since Safety Injection cannot be terminated, FRP-P.1 provides an immediate transition back to the path.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. SBLOCA is a concern for PTS
- C. Incorrect. Not reason for this procedure transition

D. Incorrect. Wrong reason for transition back

Technical Reference(s): FRP-P.1 Basis Document (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	2	_____
	K/A #	E04EK2.1	_____
	Importance Rating	3.5	_____

Knowledge of the interrelations between LOCA Outside Containment and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features

Proposed Question: RO 91

Given the following plant conditions:

- The unit was initially at 100% power.
- A Reactor Trip and Safety Injection have occurred.
- R-14C, Plant Effluent Noble Gas Monitor, is in alarm.
- Area Radiation Monitor Readings in the Auxiliary Building are increasing.
- The Crew has transitioned from PATH-1 to EPP-20, LOCA Outside Containment.

Why does EPP-20, LOCA Outside Containment, direct the operator to close RHR-744A & RHR-744B, RHR COLD LEG INJ?

- To determine if the leak is in the Cold Leg Injection piping
- To establish a Hot Leg Injection flow path
- To establish an injection flow path from the Charging Pumps
- To determine if the leak is in the Charging Line

Proposed Answer: A

Explanation (Optional):

- Correct. The valves are closed to determine if the leak is in the Cold Leg Injection piping
- Incorrect. Flow path not established in EPP-20
- Incorrect. Flow Path not established in EPP-20
- Incorrect. Closing these valves would not isolate Charging line

Technical Reference(s): EPP-20 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	009EA2.39	_____
	Importance Rating	_____	4.7

Ability to determine or interpret the following as they apply to the Small Break LOCA: Adequate Core Cooling

Proposed Question: SRO 91

Given the following conditions:

- Reactor has tripped. Safety Injection has actuated.
- The crew is evaluating RCP trip criteria in PATH-1.
 - SI pumps are operating and delivering flow to the RCS.
 - RCS Subcooling is 31 deg F.
 - CETs indicate 500 deg F and trending down slowly.
 - RCS Pressure is 925 psig and stable.

Which ONE (1) of the following describes the condition of the RCS and action required?

- A. SI is providing Core Cooling. Leave RCP's operating. Transition will be made to EPP-8, Post LOCA Cooldown and Depressurization.
- B. SI is providing Core Cooling. Trip RCPs. Transition will be made to EPP-8, Post LOCA Cooldown and Depressurization.
- C. Core Cooling is NOT adequate. Leave RCPs operating. Core Cooling will be restored using FRP-C.2, Response to Degraded Core Cooling.
- D. Core Cooling is NOT adequate. Trip RCPs. Core Cooling will be restored using FRP-C.2, Response to Degraded Core Cooling.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. RCP trip criteria met
- B. Correct. SI pumps operating indicate adequate core cooling. Subcooling is below 35, so trip RCPs

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

Knowledge of the operational implications of the following concepts as they apply to Rediagnosis: Components, capacity, and function of emergency systems

Proposed Question: RO 92

Following a Reactor Trip and Safety Injection actuation, the crew is performing EPP-7, SI Termination.

The following conditions exist:

- Both SI pumps have just been stopped.
- Pressurizer level is 10% and trending down slowly.
- RCS pressure is 1675 psig and trending down slowly.
- RCS temperature is 533 deg F and stable.

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

- Go to AOP-016, Excessive Primary Plant Leakage, and start all available Charging Pumps.
- Start both SI pumps and go to PATH-1, entry point C to determine which recovery procedure to use.
- Start both SI pumps and go to EPP-8, Post LOCA Cooldown and Depressurization.
- Remain in EPP-7, secure Letdown, and wait until pressurizer level stabilizes prior to restarting ECCS equipment.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Wrong procedure
- Correct
- Incorrect. Wrong entry point

H. Incorrect. Letdown will still be isolated at this point. Foldout does not allow for this action

Technical Reference(s): Foldout B and EPP-7 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	022AA2.04	_____
	Importance Rating	_____	3.8

Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: How long PZR level can be maintained within limits

Proposed Question: SRO 92

Given the following conditions:

- The plant is at 100% power.
- An instrument failure caused Letdown to isolate.
- Charging and Letdown are secured.
- Pressurizer level is trending down at approximately 1% every 5 minutes.

With NO further action by the crew, how long will pressurizer level remain above the Low Level Heater Cutout setpoint?

- A. Less than 1 hour.
- B. 1-2 hours.
- C. 2-3 hours.
- D. 3-4 hours.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect
- B. Incorrect
- C. Incorrect
- D. Correct. 53% at 100% power. 14% at cutout. 1% every 5 minutes is approximately 200 minutes

Technical Reference(s): Pressurizer SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO X	SRO
	Tier #	1	
	Group #	2	
	K/A #	025AA207	
	Importance Rating	3.4	

Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal: Indications of cavitation

Proposed Question: RO 93

Given the following conditions:

- RHR is in service at Reduced Inventory conditions at (-) 65 inches.
- AOP-020, Loss of Residual Heat Removal, has been implemented.

Which ONE (1) of the following indications in the Control Room are used to determine if cavitation is occurring IAW AOP-020?

- A. RHR total flow and pump amps.
- B. RHR total flow and pump discharge pressure.
- C. RHR pump discharge pressure and RVLIS Full Range level.
- D. RHR total flow and RVLIS Full Range level.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect because amps are not used
- B. Correct.
- C. Incorrect because RVLIS not used
- D. Incorrect because RVLIS not used

Technical Reference(s): AOP-020 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	E05 G 2.4.1	
	Importance Rating		4.6

Knowledge of EOP entry conditions and immediate action steps

Proposed Question: SRO 93

Given the following conditions:

- Reactor Trip and SI have occurred from 100% power.
- CRSS is reviewing Foldout 'A'.
- The STA informs the CRSS of a valid RED path on Heat Sink.

Which ONE (1) of the following actions should the CRSS take?

- Transition to FRP-H.1, Response to Loss of Secondary Heat Sink.
- Transition to FRP-H.1 after Foldout 'A' has been reviewed.
- Transition to FRP-H.1 when directed by the heat sink evaluation steps of PATH-1.
- Review all CSFs to determine if any higher priority RED paths exist, then transition to the highest priority RED path.

Proposed Answer: C

Explanation (Optional):

- Incorrect. Have not monitored CSFTs yet
- Incorrect. Foldout 'A' has no transition to heat sink
- Correct.
- Incorrect. CSFSTs not yet being monitored

Technical Reference(s): OMM-22 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	033AA208	
	Importance Rating	3.3	

Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation:
Intermediate range channel operability

Proposed Question: RO 94

The Unit is operating at 100 % power.

The Instrument Power fuses for Intermediate Range Channel N35 are blown.

Which ONE (1) of the following describes the operability of the Intermediate Range High Flux Trip IAW Precautions and Limitations of OP-002, Nuclear Instrumentation?

- A. The channel is OPERABLE, no further action required.
- B. The channel is OPERABLE but not required in MODE 1.
- C. The channel is INOPERABLE, reference TS for applicable action(s) required.
- D. The channel is INOPERABLE but not required until the plant is in MODE 3.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Channel is inoperable
- B. Incorrect. Channel is inoperable
- C. Correct.
- D. Incorrect. Channel is required in MODE 1 below P-10

Technical Reference(s): TS Table 3.3.1-1 (Attach if not previously provided)

NIS SD

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>2</u>
	K/A #	<u>058AK3.02</u>	
	Importance Rating	_____	<u>4.2</u>

Knowledge of the reasons for the following responses as they apply to the Loss of DC Power : Actions contained in EOP for loss of DC Power

Proposed Question: SRO 94

Given the following conditions:

- The plant tripped from 100% power due to a loss of DC Bus 'A'.
- Instrument Busses 1 and 2 are de-energized.

Which ONE (1) of the following actions will be required to regain the instrument busses?

- A. IAW EPP-26, align IB-1 and IB-2 to MCC-8.
- B. IAW EPP-26, align IB-1 and IB-2 to MCC-5 supplied from DS Bus.
- C. IAW Foldout 'A', align IB-1 to MCC-8. Align IB-2 to MCC-5 supplied from DS Bus.
- D. IAW Foldout 'A', align IB-1 to MCC-5 supplied from DS Bus. Align IB-2 to MCC-8.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Only 1 IB aligned to MCC-8
- B. Incorrect. 1 supplied from DS bus
- C. Incorrect. Opposite of direction
- D. Correct.

Technical Reference(s): Foldout A (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	3	
	K/A #	076A3.02	
	Importance Rating	3.7	

Ability to monitor automatic operations of the Service Water System (SWS) including: Emergency heat loads

Proposed Question: RO 95

Given the following plant conditions:

- The Unit was in MODE 1 at 100% RTP, when a Pressurizer PORV failure caused a reactor trip.
- APP-008-F7, SOUTH SW HDR LO PRESS, is received.
- South SW header pressure is 29 psig and slowly decreasing.
- North SW header pressure is 42 psig and stable.

Which ONE (1) of the following contains the correct response to the Service Water system based on the above plant conditions?

V6-16A, North Hdr Turbine Bldg Cooling Water
V6-16B, South Hdr Turbine Bldg Cooling Water
V6-16C, Turbine Bldg Cooling Water Isolation

- V6-16A, V6-16B, and V6-16C closed as soon as SW pressure decreased to < 31 psig.
- Only V6-16B and V6-16C closed as soon as SW pressure decreased to < 31 psig.
- After one minute with SW pressure < 31 psig, only V6-16B and V6-16C will close.
- After one minute with SW pressure < 31 psig, V6-16A, V6-16B, and V6-16C will close.

Proposed Answer: C

Explanation (Optional):

- Incorrect. V6-16B and C will close. There is a time delay of 60 seconds < 31 psig coincident with a turbine trip
- Incorrect. There is a one minute time delay
- Correct.

D. Incorrect. One minute time delay and V6-16A will not close

Technical Reference(s): SWS SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	E03EA2.2	_____
	Importance Rating	_____	4.1

Ability to determine and interpret the following as they apply to LOCA Cooldown and Depressurization: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments

Proposed Question: SRO 95

Which ONE (1) of the following describes the preferred method of operating RCPs during performance of EPP-8, Post LOCA Cooldown and Depressurization?

- A. Starting any RCP is undesirable because starting an RCP during Natural Circulation may cause a SG safety valve to lift.
- B. Starting one RCP is desirable to provide pressurizer spray flow and mix the RCS.
- C. Starting any RCP is undesirable because the heat input will delay RCS cooldown.
- D. Starting 2 or more RCPs is desirable because it collapses RCS voids and allows true measurement of RCS inventory.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. SG SV may lift but not a reason to keep RCPs off
- B. Correct
- C. Incorrect. Not an event where heat input is a consideration
- D. Incorrect. Only 1 RCP required to perform these functions

Technical Reference(s): EPP-8, Basis Document (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	015K3.02	
	Importance Rating	3.3	

Knowledge of the effect that a loss or malfunction of the Nuclear Instrumentation System (NIS) will have on the: CRDS

Proposed Question: RO 96

Given the following plant conditions:

- Mode 1 at 100% RTP with bank D rods at 218 steps.
- A failure of 'B' Inverter occurs.
- Reactor trip did NOT occur.
- Rods cannot be withdrawn.

Which ONE (1) of the following is preventing rod motion?

- A. Power Range Overpower Rod Stop.
- B. Intermediate Range High Level Rod Stop.
- C. Overtemperature Delta T Rod Stop.
- D. Overpower Delta T Rod Stop.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. IR would not be active at this power
- C. Incorrect. Would have runback
- D. Incorrect. Would also have runback

Technical Reference(s): NIS SD (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	3
	K/A #	028AA2.11	_____
	Importance Rating	_____	3.6

Ability to determine or interpret the following as it applies to Pressurizer Level Control malfunction: Leak in Pressurizer

Proposed Question: SRO 96

Given the following conditions:

The plant is operating at 100% power.

- Charging flow is trending down slowly.
- Pressurizer Level is trending up slowly.
- RCS Pressure is trending down slowly.
- RCS subcooling is trending down slowly.

Which ONE (1) of the following events is in progress?

- A. Pressurizer Surge Line leak.
- B. Pressurizer Steam Space leak.
- C. Pressurizer level variable leg leak.
- D. Pressurizer level Master Controller, LC-459G, is failing low.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Wrong direction on level
- B. Correct.
- C. Incorrect. Wrong direction on level
- D. Incorrect. Wrong direction on level

Technical Reference(s): Simulator

(Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	014K501	
	Importance Rating	2.7	

Knowledge of the operational implications of the following concepts as they apply to the Rod Position Indication System (RPIS):
Reasons for differences between RPIS and step counter

Proposed Question: RO 97

Individual Rod Position Indicators (IRPI) and step counters read differently.

Which ONE (1) of the following correctly describes the reason for the difference in indication?

- A. Step Counters indicate actual rod position. IRPI is an estimate of rod position generated from the ERFIS computer.
- B. IRPI indicates actual rod position as determined by a coil stack on the CRDM housing. Step Counters indicate demanded position from the Rod Control system.
- C. Step counters indicate actual rod position as determined by a coil stack on the CRDM housing. IRPI indicates demanded position from the Rod Control system.
- D. IRPI is an estimate of rod position generated from the ERFIS computer. Step Counters indicate demanded position from the Rod Control system.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. IRPI is displayed on ERFIS, not generated from it. Counters are demanded position
- B. Correct
- C. Incorrect. Reverse of actual
- D. Incorrect. IRPI is displayed, not generated from, ERFIS

Technical Reference(s): RPI SD (Attach if not previously provided)

Rod Control SD

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	1
	Group #	3	3
	K/A #	036AA2.01	
	Importance Rating	3.1	3.9

Ability to determine and interpret the following as they apply to Fuel Handling Incidents: ARM system indications

Proposed Question: RO 98 SRO 97

Given the following conditions:

- A Fuel handling Accident has just occurred in the Spent Fuel Pit area.
- AOP-013, Fuel Handling Accident, directs the crew to determine if an unplanned release is in progress due to breached fuel.

Which ONE (1) of the following describes the radiation monitor that indicates an unplanned release may be in progress if it is increasing or in alarm?

- A. R-30, Fuel Handling Building Lower Level High Range
- B. R-11 and R-12, CV Air and Plant Vent
- C. R-14C, Plant Effluent Noble Gas-Low Range
- D. R-21, Fuel Handling Building Upper Level

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Not used for release determination
- B. Incorrect. CV monitors
- C. Correct.
- D. Incorrect. Not for release monitoring

Technical Reference(s): AOP-013 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	2
	Group #	_____	1
	K/A #	015K4.02	_____
	Importance Rating	_____	3.9

Knowledge of Nuclear Instrumentation System (NIS) design features or interlocks providing for the following: Rod Motion Inhibits
Proposed Question: SRO 98

Which ONE (1) of the following describes the function of the Intermediate Range High Flux Level Rod Stop?

Blocks rod withdrawal in MANUAL and....

- A. is automatically defeated above P-10.
- B. must be manually defeated above P-10.
- C. is automatically defeated above P-6.
- D. must be manually defeated above P-6.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Not automatically defeated
- B. Correct.
- C. Incorrect. Wrong power and must be manually defeated
- D. Incorrect. Wrong power level

Technical Reference(s): SD-010 _____ (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	029EA1.09	
	Importance Rating	4.0	

Ability to operate and/or monitor the following as they apply to the ATWS: Manual Rod Control

Proposed Question: RO 99

Given the following conditions:

- Reactor Power is 55%.
- RCS pressure is 1850 psig and slowly decreasing.
- The crew UNSUCCESSFULLY attempted to trip the reactor from the control room.

Which ONE (1) of the following contains ONLY Immediate Operator Actions IAW FRP S.1, 'Response To Nuclear Power Generation/ATWS'?

- A. Check Reactor Trip; Verify E-1 and E-2 energized.
- B. Insert Control Rods; Dispatch an operator to open reactor trip breakers.
- C. Initiate Emergency Boration; Check RCS isolated.
- D. Insert Control Rods; Verify E-1 and E-2 energized.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. E-1 and E-2 are PATH-1 IAs
- B. Correct
- C. Incorrect. Check RCS isolated is EPP-1
- D. Incorrect. E-1 and E-2 are PATH-1 IAs

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

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>002 G2.4.30</u>	
	Importance Rating	_____	<u>3.6</u>

Knowledge of which events related to system operations/status should be reported to outside agencies

Proposed Question: SRO 99

During hydrostatic testing of the RCS in Mode 5, RCS pressure is increased to 2750 psig.

Which ONE (1) of the following describes the maximum time allowed prior to notification of the NRC?

- A. 5 minutes
- B. 15 minutes
- C. 1 hour
- D. 4 hours

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Pressure must be restored within 5 minutes
- B. Incorrect. State notification time for classification
- C. Correct.
- D. Incorrect. 1 hour notification

Technical Reference(s): 10CFR50.72 (Attach if not previously provided)

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	_____
	Group #	1	_____
	K/A #	003K3.03	_____
	Importance Rating	2.8	_____

Knowledge of the effect that a loss or malfunction of the Reactor Coolant Pump System (RCPS) will have on the following:
Feedwater and emergency feedwater

Proposed Question: RO 100

Given the following conditions:

- The plant is at 17% power, normal system alignment.
- All FRVs are in AUTO.
- 'A' RCP trips on overcurrent.

Which ONE (1) of the following describes the effect on feedwater flow to the SGs from steady-state to steady-state?

- Feedwater flow remains the same to all SGs.
- Feedwater flow is reduced to all SGs.
- Feedwater flow to SG 'A' is reduced. Feedwater flow to SG 'B' and 'C' is increased.
- Feedwater flow to SG 'A' is increased. Feedwater flow to SG 'B' and 'C' is reduced.

Proposed Answer: C

Explanation (Optional):

- Incorrect. Assumes feed control is in manual at low power
- Incorrect.
- Correct. Less heat input, less feed flow
- Incorrect. Opposite effect

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

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	003 G 2.4.1	
	Importance Rating		4.6

Knowledge of EOP entry conditions and immediate action steps

Proposed Question: SRO 100

Given the following conditions:

- The plant is operating at 100% power.
- At 0900, Annunciator APP-001-D2, RCP #1 SEAL LEAKOFF HI FLOW, alarms.
- At 0901, the RO reports #1 seal leakoff is 5.2 GPM for RCP 'A'.
- At 0905, the RO reports #1 seal leakoff is 5.8 GPM for RCP 'A', and #1 seal leakoff for RCP 'B' and RCP 'C' have lowered from 3.0 GPM to 2.0 GPM.

Which ONE (1) of the following describes the action required and basis for the order of action?

- A. Trip the reactor, trip RCP 'A'; enter PATH-1 to prevent challenging a Safety Function.
- B. Trip the reactor, trip RCP 'A'; allow PATH-1 actions to be completed prior to entering AOP-018, Reactor Coolant Pump Abnormal Conditions.
- C. Reduce power to < 40%, trip RCP 'A', trip reactor, verify reactor tripped; avoid delaying RCP trip in the event an ATWS occurs.
- D. Reduce power to < 40%, trip RCP 'A', trip reactor, verify reactor tripped; ensure actions of AOP-018, Reactor Coolant Pump Abnormal Conditions, are performed prior to PATH-1 entry.

Proposed Answer: A

Explanation (Optional):

- A. Correct
- B. Incorrect. AOP-018 would be performed prior to path
- C. Incorrect. Trip reactor first
- D. Incorrect. Trip reactor first

Technical Reference(s): AOP-018 and basis document (Attach if not previously provided)
