

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

Applicant Information

Name:	Region: I
Date: 10/4/2002	Facility/Unit: LIMERICK UNITS 1 & 2
License Level: SRO	Reactor Type: GE
Start Time:	Finish Time:

Instructions

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

Applicant Certification

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

Applicant's Signature

Results

Examination Value	_____ 100 _____	Points
Applicant's Score	_____	Points
Applicant's Grade	_____	Percent

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Question: 1

Unit 1 plant conditions are as follows:

- Reactor power is 40%
- CRD system flow is 62 gpm
- CRD drive water differential pressure is 240 psid
- "1B" CRD flow control valve is in service
- CRD stabilizing flow is 6 gpm

WHICH ONE of the following actions is required based on the above conditions?

- a. Swap to "1A" CRD flow control valve
- b. Swap to the alternate set of stabilizing valves
- c. Adjust CRD flow control valve controller to 65 gpm
- d. Throttle closed the CRD drive water pressure control valve

Answer Key and Question Data

Question # 01	
Choice	Basis or Justification
a.	Incorrect – the normal flow control valve for this reactor power/pressure is the “1B”. “1A” is used when not at rated pressure.
b.	Incorrect – the inservice stabilizing valves are performing properly with the correct amount of flow.
c.	Incorrect – CRD system flow is within the band of 50-63 gpm as established in S46.1.A...adjusting to 65 gpm will make flow out of the band.
d.	Correct – throttling closed the drive water pressure control valve is required to raise drive water differential pressure to the normal band of 255-265 psig per S46.1.A.

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	S46.1.A		
Learning Objective:	LLOT0070.07		
Knowledge/Ability:	201001 A4.04	Importance:	RO 3.1 / SRO 3.0
(Description of K&A, from catalog) Ability to manually operate and/or monitor in the control room: drive water header pressure control valve			

Prepared by: caf

Question: 2

Unit 2 plant conditions are as follows:

- ATWS is in progress
- Reactor Power 54%
- Reactor Pressure 900 psig

"2A" SLC pump was manually started with the following indications:

- Squib Valve continuity Light – "OFF"
- Manual Override Light – "OFF"
- SLC Discharge Pressure – 950 psig
- Standby Liquid Tank Hi/Lo Level alarm has annunciated

WHICH ONE of the following describes the status of the "2A" SLC Pumps and Squib Valves based on the above conditions?

	<u>"2A" SLC Pump</u>	<u>"2A" Squib Valve</u>
a.	Running	Fired
b.	Running	Not Fired
c.	Not Running	Fired
d.	Not Running	Not Fired

Answer Key and Question Data

Question # 02	
Choice	Basis or Justification
a.	Correct
b.	Incorrect, Squib Valve continuity light OFF indicates that the squib valve has fired
c.	Incorrect, Manual start of the "2A" SLC pump with discharge pressure above RPV pressure is indication the "2A" SLC pump is running
d.	Incorrect, Indications are provided that the pump has started, Red Pump Status indicating light "ON", and that the squib valve has fired, Squib Valve continuity light is "OFF"

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		SRO

Source Documentation	
Source:	New Exam Item
Reference(s):	S48.1.B, Standby Liquid Control Manual Initiation
Learning Objective:	LLOT0310.5a
Knowledge/Ability:	211000A1.10
	Importance: RO 3.7 / SRO 3.7
(Description of K&A, from catalog)	
Ability to predict and/or monitor changes in parameters associated with operating the SLC system controls including: Lights and alarms	

Prepared by: CBG

Question: 3

Unit 2 plant conditions are as follows:

- Reactor power is 90%
- APRM #3 is NOT bypassed and is simulated to have a flux of 118.6% per ST-2-074-628-2, FUNCTIONAL CHECK OF AVERAGE POWER RANGE MONITOR 3 (APRM3)

WHICH ONE of the following will result from this action based on the above conditions?

- a. "A1" side half-scrum only
- b. "A2" side half-scrum only
- c. "A1" and "A2" side half-scrums
- d. Upscale alarm and no half-scrum signals

Answer Key and Question Data

Question # 03	
Choice	Basis or Justification
a-b-c.	Incorrect – one APRM upscale will not cause a half-scam signal. Before the recent modification to RPS, an single APRM trip resulted in a half scam.
d.	Correct – one APRM upscale will not cause a half-scam signal

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	ST-2-074-628-2
Learning Objective:	LLOT0275.17
Knowledge/Ability:	212000 K4.05 Importance: RO 3.4 / SRO 3.6
(Description of K&A, from catalog) Knowledge of Reactor Protection System design features and/or interlocks which provide for the following: Functional testing of the system while maintaining power operation	

Prepared by: caf

Question: 4

Unit 2 plant conditions are as follows:

- Reactor shutdown
- MSIV isolation has occurred
- An Instrument Gas rupture has resulted in a complete depressurization of both Instrument Gas headers.

An Emergency Blowdown has been directed and the "2K" SRV has failed to open. All other ADS valves have opened.

WHICH ONE of the following describes the non-ADS SRV that can be manually opened from the Main Control Room to complete the Emergency Blowdown based on the above conditions?

- a. "2N" SRV
- b. "2J" SRV
- c. "2G" SRV
- d. "2B" SRV

Answer Key and Question Data

Question # 04	
Choice	Basis or Justification
a.	Correct
b.	With a loss of instrument gas all non-ADS SRVs (except "C", "A", and "N") will lose gas pressure to the operator. Only ADS SRVs and SRVs "C" "A" and "N" have accumulators that will allow for operation without Instrument gas pressure
c.	With a loss of instrument gas all non-ADS SRVs (except "C", "A", and "N") will lose gas pressure to the operator. Only ADS SRVs and SRVs "C" "A" and "N" have accumulators that will allow for operation without Instrument gas pressure
d.	With a loss of instrument gas all non-ADS SRVs (except "C", "A", and "N") will lose gas pressure to the operator. Only ADS SRVs and SRVs "C" "A" and "N" have accumulators that will allow for operation without Instrument gas pressure

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	
Learning Objective:	LLOT0120.6a
Knowledge/Ability:	239002A4.01
	Importance: RO 4.4 / SRO 4.4
(Description of K&A, from catalog)	
Ability to manually operate and/or monitor in the control room: SRVs	

Prepared by: CBG

Question: 5

Unit 2 plant conditions are as follows:

- 80% power
- Reactor Feedwater Master Level Controller and all RFP Manual/Auto (M/A) Stations are in AUTOMATIC

The Operator places "2A" RFP M/A Station to MANUAL

WHICH ONE of the following describes subsequent actions that will change "2A" RFP speed as indicated based on the above conditions?

- a. Raise "2A" RFP speed by depressing the Master Level Controller MANUAL CONTROL "OPEN" pushbutton
- b. Raise "2A" RFP speed by moving the Master Controller set point tape from a setting of "35" to "37"
- c. Lower "2A" RFP speed by placing the "2A" Motor Speed Changer control switch to "SLOW LOWER"
- d. Lower "2A" RFP speed by placing the "2A" hydraulic jack control switch to "ON"

Answer Key and Question Data

Question # 5

Choice	Basis or Justification
a.	Incorrect. The master controller output will not change using the buttons unless in manual.
b.	Incorrect. The master controller output will change, but the pump will not respond with the M/A station in MANUAL
c.	Correct. The feed pump will respond to the MSC when its output becomes the lower value demand
d.	Incorrect. The MSC is on the high speed stop and the jack will not activate, and the jack cannot lower the speed.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation		
Source:	New Exam Item	
Reference(s):	S06.0.E	
Learning Objective:	LLOT0550.08b	
Knowledge/Ability:	259002K1.05	Importance: 3.6/3.7
(Description of K&A, from catalog) Knowledge of the physical connections and cause effect relationship between Reactor Water Level Control and reactor feed pumps		

Prepared by: JMS

Question: 6

WHICH ONE of the following indicates a control rod is fully inserted following a SCRAM per GP-11, REACTOR PROTECTION SYSTEM - SCRAM RESET?

- a. Green full core display lamp lit ten seconds after the SCRAM
- b. Blue SCRAM lamp lit seven seconds after the SCRAM
- c. Four rod display indicates "-- --" seven seconds after the SCRAM
- d. Process computer indicates "***" position ten seconds after the SCRAM

Answer Key and Question Data

Question # 6

Choice	Basis or Justification
a.	Correct. Indication is present only if rod is full in
b.	Indicates both scram valves open only. Does not confirm rod went in
c.	Indicates rod on odd switch position, but not necessarily in
d.	Indicates rods have moved, but does not confirm full in

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO

Source Documentation		
Source:	New Exam Item	
Reference(s):	GP-11	
Learning Objective:	LLOT0060.07	
Knowledge/Ability:	201003A4.02	Importance: 3.5/3.5
(Description of K&A, from catalog)		
Ability to manually operate and or monitor in the control room CRD mechanism position		

Prepared by: JMS

Question: 7

A condenser hotwell leak causes both hotwell makeup valves to fully open.

WHICH ONE of the following describes the dedicated ECCS volume that will remain in the CST, and the design feature that will ensure this volume based on the above condition?

	<u>Dedicated ECCS Volume</u>	<u>Design Feature</u>
a.	195,000 gal.	Standpipe
b.	135,000 gal.	Standpipe
c.	195,000 gal.	Makeup valve auto closure
d.	135,000 gal.	Makeup valve auto closure

Answer Key and Question Data

Question # 07	
Choice	Basis or Justification
a.	Incorrect – ECCS dedicated volume is 135,000 (29 ft.), not 195,000 gal.
b.	Correct – standpipe opening at 29 ft corresponds to 135,000 gal.
c.	Incorrect - ECCS dedicated volume is 135,000 (29 ft.), not 195,000 gal., and there is no auto closure of hotwell makeup valves on low CST level
d.	Incorrect - there is no auto closure of hotwell makeup valves on low CST level

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	T.S. 3.5.3.b.3
Learning Objective:	LLOT0480.02
Knowledge/Ability:	256000 K4.08
	Importance: RO 3.6 / SRO 3.6
(Description of K&A, from catalog) Knowledge of REACTOR CONDENSATE SYSTEM design features and/or interlocks which provide for the following: Dedicated ECCS water supply (plant specific)	

Prepared by: caf

Question: 8

Unit 2 plant conditions are as follows:

- Loss of Division I DC power

WHICH ONE of the following describes the ability to open a single SRV for a controlled cooldown based on the above condition?

- a. "2A" SRV from the MCR
- b. "2C" SRV from the RSP
- c. "2K" SRV from the AER
- d. "2S" SRV from the MCR

Answer Key and Question Data

Question # 08	
Choice	Basis or Justification
a-b-d	Incorrect. The SRVs listed are either powered only from Div 1 or have no control outside the MCR.
c.	Correct. The "K" SRV is an ADS SRV and is equipped with an individual control switch in the Aux Equip Room

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO

Source Documentation	
Source:	New Exam Item
Reference(s):	E-1FA
Learning Objective:	LLOT0120.12A
Knowledge/Ability:	263000K3.02
	Importance: RO 3.5 / SRO 3.5
(Description of K&A, from catalog)	
Knowledge of Electrical Distribution system will have on the following: Components using D.C. Control power	

Prepared by: CBG

Question: 9

Unit 1 plant conditions are as follows:

- OPCON 5 with core alterations in progress
- Refuel Floor HVAC is in service

Service air header pressure has dropped to zero and cannot be restored

WHICH ONE of the following describes the impact, if any, on Refuel Floor Secondary Containment HVAC and Inflatable Seals based on the above conditions?

	<u>Refuel Floor HVAC</u>	<u>Inflatable Seals</u>
a.	Trips	Pressure maintained using normal air supply
b.	Trips	Pressure maintained on backup bottles
c.	Continues operating	Pressure maintained using normal air supply
d.	Continues operating	Pressure maintained on backup bottles

Answer Key and Question Data

Question # 9

Choice	Basis or Justification
a. b. c.	Incorrect. Service air is needed for seals and instrument air is used by HVAC
d.	Correct. Seals lose air and swap to small backup bottles. Later they are connected manually to larger bottles

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L		

Source Documentation

Source:	New Exam Item		
Reference(s):	M-15		
Learning Objective:	LLOT0730.02		
Knowledge/Ability:	290001K6.08	Importance:	2.7/ 2.8
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the plant air system will have on secondary containment			

Prepared by: JMS

Question: 10

Unit 1 plant conditions are as follows:

- Reactor power at 100% for the past 15 months

A Group I isolation and reactor scram occurs.

WHICH ONE of the following describes the expected pressure response over the next 5 minutes, and the primary reason for that response based on the above conditions?

- a. Rises due to decay heat
- b. Rises due to fission rate equivalent to 6% power
- c. Drops due to ambient heat losses from the RPV
- d. Drops due to EHC pressure setpoint less than RPV pressure

Answer Key and Question Data

Question # 10

Choice	Basis or Justification
a.	Correct – decay heat is the cause of the expected pressure rise
b.	Incorrect – fission rate goes to approximately zero following a scram
c.	Incorrect – decay heat rate is greater than ambient losses during the first 5 minutes following a scram from 100% power history
d.	Incorrect – MSIVs automatically close on a Group I isolation

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L		

Source Documentation

Source:	New Exam Item		
Reference(s):	UFSAR chapter 15		
Learning Objective:	LLOT1575.03		
Knowledge/Ability:	295006 AK3.03	Importance:	RO 3.8 / SRO 3.9
(Description of K&A, from catalog) Knowledge of the reasons for the following responses as they apply to SCRAM: Reactor pressure response			

Prepared by: caf

Question: 11

Unit 1 plant conditions are as follows:

- Reactor startup is in progress
- "1D" IRM failed downscale and bypassed
- All other IRMs are on range 3
- ST-6-107-884-1, NEUTRON MONITORING SYSTEM OVERLAP VERIFICATION ON STARTUP is in progress

The "1C" IRM fails downscale.

WHICH ONE of the following describes the plant response and action that must be taken prior to continuing with the startup based on the above conditions?

	<u>Plant Response</u>	<u>Action</u>
a.	Rod Block	"1D" or "1C" IRM must be restored to service
b.	Half Scram	"1D" or "1C" IRM must be restored to service, Reset Half Scram
c.	Rod Block	Bypass the "1C" IRM
d.	Half Scram	Bypass the "1C" IRM, Reset Half Scram

Answer Key and Question Data

Question # 11	
Choice	Basis or Justification
a.	A minimum of 6 IRMs is required (3 per trip system). Start up may continue with 2 IRMs inoperable.
b.	"1C" IRM failing downscale will only result in a rod block. A minimum of 6 IRMs is required (3 per trip system).
c.	Correct
d.	"1C" IRM failing downscale will only result in a rod block. A minimum of 6 IRMs is required (3 per trip system).

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	ST-6-107-884-1	
Learning Objective:	LLOT0080.6	
Knowledge/Ability:	201002A2.04	Importance: RO 3.2 / SRO 3.1
(Description of K&A, from catalog)		
Ability to (a) predict the impacts of the following on the RMCS system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Control Rod Block		

Prepared by: CBG

Question: 12

Unit 1 plant conditions are as follows:

- Reactor power is 100%
- Both Reactor Recirculation pumps are operating at 80% speed

The following sequence of events occurs for the "1A" Reactor Recirculation MG set:

- The running MG set AC lube oil pump trips
- MG set lube oil pressure drops to 25 psig for 10 seconds
- MG set lube oil pressure returns to 35 psig after the standby MG set AC lube oil pump starts

WHICH ONE of the following describes the required actions based on the above conditions?

- a. Ensure "1A" Reactor Recirculation pump runs back to 28% speed
- b. Ensure "1A" Reactor Recirculation pump runs back to 42% speed
- c. Drive in rods to reduce power to less than 33% rated thermal power
- d. Drive in rods until Fraction of Limiting Load Line Power (FLLLP) is < 0.998

Answer Key and Question Data

Question # 12

Choice	Basis or Justification
a.	Incorrect – less than 30 psig lube oil pressure for greater than 6 seconds will cause a RRP trip
b.	Incorrect – less than 30 psig lube oil pressure for greater than 6 seconds will cause a RRP trip
c.	Correct
d.	Incorrect – control rods must be driven in until power less than 33% per OT-112.

Required Attachments or Reference	None
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	OT-112		
Learning Objective:	LLOT0040.13		
Knowledge/Ability:	202002 A2.01	Importance:	RO 3.4 / SRO 3.4

(Description of K&A, from catalog) Ability to (a) predict the impacts of a recirculation pump trip on the RECIRCULATION FLOW CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of a recirculation pump trip.

Prepared by: caf

Question: 13

Unit 1 plant conditions are as follows:

- A LOCA is in progress
- Reactor Pressure is 500 psig and lowering
- Drywell pressure is 7 psig and rising
- Reactor level is -120 inches and stable

AC power is lost to the HV-51-1F017B (OUTBOARD B).

WHICH ONE of the following describes the RPV injection source and flow path available through the "B" Loop of RHR when reactor pressure drops to 300 psig based on the above conditions?

- a. RHR via Shutdown Cooling Line
- b. Fire water via crosstie valve
- c. Condensate transfer via keepfull line
- d. RHRSW via crosstie valves

Answer Key and Question Data

Question # 13	
Choice	Basis or Justification
a.	Correct
b.	Injection with firewater requires HV-51-1F017B to be open. With a loss of power, the HV-51-1F017B will remain closed. Use of fire water also requires pressure to be less than 80 psig
c.	Injection with keepfull requires HV-51-1F017B to be open. With a loss of power, the HV-51-1F017B will remain closed.
d.	Injection with RHRSW requires HV-51-1F017B to be open. With a loss of power, the HV-51-1F017B will remain closed. Use of RHRSW requires pressure to be less than 120 psig

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-243,244,245	
Learning Objective:	LLOT0370.16a	
Knowledge/Ability:	203000A2.04	Importance: 3.5 RO / 3.6 SRO
(Description of K&A, from catalog)		
Ability to predict the impacts of the following on the RHR/LPCI: Injection Mode system; and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A.C. failures		

Prepared by: CBG

Question: 14

Unit 1 plant conditions are as follows:

- Reactor power 100%
- Suppression pool level is 23.5 ft.
- HPCI is aligned for auto operation
- All four HPCI exhaust line vacuum breakers are inoperable (stuck closed)

The following sequence of events occurs:

- A reactor scram occurs due to a trip of all three reactor feedwater pumps
- HPCI starts automatically on low RPV level
- HPCI then trips automatically on high RPV level

WHICH ONE of the following describes the potential consequence based on the above conditions?

- a. HPCI turbine overspeed
- b. Exhaust line water hammer
- c. Excessive control valve DP
- d. Vacuum breaker isolation failure

Answer Key and Question Data

Question # 14	
Choice	Basis or Justification
a.c.d	Incorrect . Overspeed, control valve Dp, and vacuum breaker isolation failure are valid turbine problems, but not related to exhaust line water intrusion
b.	Correct – without vacuum breaker capability, the condensing steam in the exhaust header will draw a vacuum in the header, which will draw in water from the suppression pool. This water will cause a water hammer on the next HPCI start.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	UFSAR chapter 6.3
Learning Objective:	LLOT0340.02
Knowledge/Ability:	206000 K5.08
	Importance: RO 3.0 / SRO 3.2
(Description of K&A, from catalog) Knowledge of the operational implications of the following concepts as they apply to HIGH PRESSURE COOLANT INJECTION SYSTEM: Vacuum breaker operation	

Prepared by: caf

Question: 15

Unit 1 plant conditions are as follows:

- A loss of coolant accident is in progress
- Reactor Level has dropped to a minimum of -120 inches and stable
- Reactor Pressure 500 psig and lowering
- Drywell pressure is 6.2 psig and rising

A loss of Division III DC power has occurred.

WHICH ONE of the following describes the status of "1A" and "1C" Core Spray Pumps after reactor pressure drops to 300 psig based on the above conditions?

	<u>"1A" Core Spray Pump</u>	<u>"1C" Core Spray Pump</u>
a.	Running and injecting	Running and injecting
b.	Running and injecting	NOT Running
c.	NOT Running	Running and injecting
d.	NOT Running	NOT Running

Answer Key and Question Data

Question # 15	
Choice	Basis or Justification
a-c-d	Incorrect. Loss of DIV III control power will make the C pump fail to start. Plausible because the A and C pumps share a DIV 1 controlled injection path.
b.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	E1FC Loss of Division III Safeguard 125V DC BUS 1FC
Learning Objective:	LLOT0350 / .12
Knowledge/Ability:	209001K2.03
Importance:	RO 2.9 / SRO 3.1
(Description of K&A, from catalog)	
Knowledge of electrical power supplies to the following: Initiation Logic	

Prepared by: CBG

Question: 16

Unit 2 plant conditions are as follows:

- OPCON 5
- Control rod stroke time testing is in progress
- Core Verification has been completed

SRM DOWNSCALE alarm is lit with the following indications:

<u>SRM</u>	<u>Count Rate</u>	<u>Signal-to-Noise Ratio</u>
A	2.0	2.0
B	1.4	3.5
C	2.8	3
D	1.8	4

WHICH ONE of the following quadrant(s) can control rod strokes be performed in based on the above conditions?

- Quadrants A and B
- Quadrants B and C
- Quadrants A and D
- Quadrants C and D

Answer Key and Question Data

Question # 16

Choice	Basis or Justification
a.	Both "A" and "B" SRM are inoperable. To commence rod testing SRM must be operable in the quadrant that the testing is occurring and one in the face adjacent quadrant
b.	"B" SRM is inoperable. To commence rod testing SRM must be operable in the quadrant that the testing is occurring and one in the face adjacent quadrant. Control rod stroking can occur in the C Quadrant
c.	"A" SRM is inoperable. To commence rod testing SRM must be operable in the quadrant that the testing is occurring and one in the face adjacent quadrant. Control rod stroking can occur in the "D" Quadrant
d.	Correct

Required Attachments or Reference	Tech Specs 3.3.6 Figure 3.3.6-1
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	Tech Specs
Learning Objective:	LLOT0240.6
Knowledge/Ability:	215004A2.04
	Importance: RO 3.5 / 3.7 SRO
(Description of K&A, from catalog)	
Ability to predict the impacts of the following on the SRM system; and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Upscale and downscale trips	

Prepared by: CBG

Question: 17

Unit 2 plant conditions are as follows:

- OPCON 2, reactor startup in progress
- RPS NI shorting links are installed
- All SRMs are fully inserted
- All IRMs are on range 2

Criticality has just been achieved, with SRM countrate as follows:

"2A" SRM – 1.4×10^5 cps
"2B" SRM – 1.1×10^5 cps
"2C" SRM – 9.2×10^4 cps
"2D" SRM – 2.3×10^5 cps

WHICH ONE of the following describes the proper positioning of the SRMs and the method for withdrawal using the "DRIVE OUT" pushbutton based on the above conditions?

	<u>SRM position</u>	<u>"DRIVE OUT" Pushbutton</u>
a.	Fully withdrawn regardless of countrate	Depress and release for continuous SRM withdrawal
b.	Withdrawn to maintain 100 to 100,000 cps	Depress and release for continuous SRM withdrawal
c.	Fully withdrawn regardless of countrate	Depress and hold for continuous SRM withdrawal
d.	Withdrawn to maintain 100 to 100,000 cps	Depress and hold for continuous SRM withdrawal

Answer Key and Question Data

Question # 17			
Choice	Basis or Justification		
a-b-c.	Incorrect		
d.	Correct – must maintain 100 to 100,000 cps until on range 3 of IRMs, and “DRIVE OUT” pushbutton must be depressed and held to continuously withdraw SRMs.		
Required Attachments or Reference			
Psychometrics			
Cognitive (H, L)	H		
Source Documentation			
Source:	New Exam Item		
Reference(s):	GP-2, Appendix 1		
Learning Objective:	LLOT0240.07		
Knowledge/Ability:	215004 2.1.30	Importance: RO 3.9 / SRO 3.4	
(Description of K&A, from catalog) Ability to locate and operate components / including local controls for the SRMs			

Prepared by: caf

Question: 18

WHICH ONE of the following describes the power distribution to the APRMs?

	<u>APRMs Powered from 1AY185</u>	<u>APRMs powered from 1BY185</u>
a.	1 and 3 only	2 and 4 only
b.	2 and 4 only	1 and 3 only
c.	1 and 4 only	2 and 3 only
d.	1, 2, 3, and 4	1, 2, 3, and 4

Answer Key and Question Data

Question # 18

Choice	Basis or Justification
a.	Incorrect. This is a recent modification to the APRM power distribution. Up until about two years ago, APRMs A, C, and E were from 1AY185, and B, D, and F were from 1BY185.
b.	Incorrect. This is a recent modification to the APRM power distribution. Up until about two years ago, APRMs A, C, and E were from 1AY185, and B, D, and F were from 1BY185.
c.	Incorrect. This is a recent modification to the APRM power distribution. Up until about two years ago, APRMs A, C, and E were from 1AY185, and B, D, and F were from 1BY185.
d.	Correct – All four APRMs receive power from both 1AY185 and 1BY185. This is a recent modification to the APRM power distribution. Up until about two years ago, APRMs A, C, and E were from 1AY185, and B, D, and F were from 1BY185.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	LLOT0275, page 26
Learning Objective:	LLOT0275.13
Knowledge/Ability:	215005 K2.02 Importance: RO 2.6 / SRO 2.8
(Description of K&A, from catalog) Knowledge of electrical power supplies to the APRM channels	

Prepared by: caf

Question: 19

Unit 2 plant conditions are as follows:

- Reactor Power 90%
- Power ascension is in progress

An instrument line break on the #17 jet pump has caused excess flow check valve actuation and a high jet pump flow signal.

WHICH ONE of the following Main Control Room readings will increase based on the above conditions?

- a. Total Core Flow
- b. Calibrated Jet Pump Flow
- c. Core Plate d/P
- d. APRM Flow Bias Scram Setpoint

Answer Key and Question Data

Question # 19	
Choice	Basis or Justification
a.	Correct
b.	Jet pump #17 is not a calibrated Jet Pump and does not effect Calibrated Jet Pump indications
c.	Core Plate d/P is not affected by changes in jet pump flows
d.	APRM flow bias reference is generated from loop flow. Jet pump flow instrumentation has no effect on APRM flow reference

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO

Source Documentation	
Source:	New Exam Item
Reference(s):	M-42
Learning Objective:	LLOT0050.9I
Knowledge/Ability:	216000K3.29
	Importance: RO 3.1 / SRO 3.2
(Description of K&A, from catalog)	
Knowledge of the effect that a loss or malfunction of the Nuclear Boiler Instrumentation system will have on Jet Pump flow monitoring	

Prepared by: CBG

Question: 20

Unit 1 plant conditions are as follows:

- Loss of feedwater flow has occurred
- RPV water level has dropped to – 60 inches

WHICH ONE of the following describes the automatic response of HV-50-1F045 (INLET) and the RCIC Governor Valve as indicated in the MCR based on the above conditions?

	<u>HV-50-1F045</u>	<u>Governor Valve</u>
a.	Cycles from fully closed to fully open	Cycles from fully closed to modulating position
b.	Cycles from fully closed to fully open	Cycles from fully open to modulating position
c.	Normally open and remains open	Cycles from fully closed to modulating position
d.	Normally open and remains open	Cycles from fully open to modulating position

Answer Key and Question Data

Question #20	
Choice	Basis or Justification
a.c.d	Incorrect. The expected sequence is for the F045 to go fully open and the governor to modulate to control speed. Common misconception is to confuse RCIC with HPCI because only the RCIC governor starts from fully open
b.	Correct.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	S49.1.D
Learning Objective:	LLOT0380.12A
Knowledge/Ability:	216000A3.02
Importance:	RO 3.6 / SRO 3.5
(Description of K&A, from catalog)	
Ability to monitor automatic operations of the RCIC system including: Turbine Startup	

Prepared by: CBG

Question: 21

Unit 1 plant conditions are as follows:

- A LOCA is in progress
- RPV level is -105 inches
- Drywell pressure is 1.4 psig
- All RHR and Core Spray pumps have been manually started

All drywell pressure instruments were calibrated with the wrong calibration sheet and will not actuate until drywell pressure reaches 61.6 psig.

WHICH ONE of the following describes when ADS will actuate after the RPV low-low-low level has been reached based on the above conditions?

- a. Immediately
- b. In 105 seconds
- c. In 525 seconds
- d. ONLY with ADS manual pushbuttons

Answer Key and Question Data

Question # 21

Choice	Basis or Justification
a.	Incorrect, after the 1.68 Hi drywell pressure bypass timer has timed out (420 seconds) the ADS 105 second timer will actuate. After both timers time out (525 seconds) ADS will actuate.
b.	Incorrect, after the 1.68 Hi drywell pressure bypass timer has timed out (420 seconds) the ADS 105 second timer will actuate. After both timers time out (525 seconds) ADS will actuate.
c.	Correct
d.	Incorrect, ADS will actuate independent of drywell pressure instrument status.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	MCR ARC 110 B-3
Learning Objective:	LLOT0330.8F
Knowledge/Ability:	218000K6.07
	Importance: RO 3.4 / SRO 3.5
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the Primary Containment Instrumentation System will have on ADS	

Prepared by: CBG

Question: 22

Unit 2 plant conditions are as follows:

- A complete loss of offsite power occurs
- D21 Diesel Generator is tripped and cannot be restarted

WHICH ONE of the following describes availability of the drywell unit cooler fans based on the above conditions?

- a. At least one fan per unit cooler has power available
- b. Only the A, C, E, and G unit coolers have a fan available
- c. All drywell cooling fans have power available
- d. No drywell cooling fans have power available

Answer Key and Question Data

Question # 22			
Choice	Basis or Justification		
a.	Correct - D21 loss results in loss of 2A1, 2C1, 2E1, and 2G1 fans only. At least one fan per unit cooler is available		
b.	Incorrect - D21 loss results in loss of 2A1, 2C1, 2E1, and 2G1 fans only. All other fans are available		
c.	Incorrect – D21 loss results in loss of 2A1, 2C1, 2E1, and 2G1 fans		
d.	Incorrect – C, D, E, and F fans are also available		
Required Attachments or Reference			
Psychometrics			
Cognitive (H, L)	L		
Source Documentation			
Source:	New Exam Item		
Reference(s):	Electrical prints E-476, sheets 1 and 2		
Learning Objective:	LLOT0140.04		
Knowledge/Ability:	223001 K2.09	Importance: RO 2.7 / SRO 2.9	
(Description of K&A, from catalog)			
Knowledge of electrical power supplies to the drywell cooling fans			

Prepared by: caf

Question: 23

Unit 2 plant conditions are as follows:

- ATWS in progress
- No actions outside the MCR have been performed
- RPV level reaches a minimum of -100 inches and stabilizes
- Drywell pressure is 3 psig and steady
- Drywell Chilled Water has been bypassed and restored per GP-8.5, CRUCIAL SYSTEM BYPASS

RPV water level is intentionally lowered to the top of active fuel.

WHICH ONE of the following describes the status of Drywell Chilled Water and Main Steam Lines one minute later based on the above conditions?

	<u>Drywell Chilled Water</u>	<u>Main Steam Lines</u>
a.	Isolated	"C" and "D" Isolated "A" and "B" NOT Isolated
b.	Isolated	All isolated
c.	Aligned to the drywell	"C" and "D" Isolated "A" and "B" NOT Isolated
d.	Aligned to the drywell	All isolated

Answer Key and Question Data

Question # 23	
Choice	Basis or Justification
a.b.c	Incorrect. The MSIVs will isolate and PCIG will remain in service. Plausible because common misconception is that the individual MSIVs correspond to individual divisions
d.	Correct. The DWCW bypass previously performed will also prevent the isolation on Lo Lo Lo level at -129 inches. The MSIVs isolation is performed using jumpers in the Aux Equip Room. This has not been performed, and the MSIVs will close.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	
Learning Objective:	LLOT0180.05
Knowledge/Ability:	223003K4.08
	Importance: 3.3/3.7
(Description of K&A, from catalog)	
Knowledge of the NSSSS design features and/or interlocks which provide for manual defeating of selected isolations during specified emergency conditions	

Prepared by: JMS

Question: 24

Unit 1 plant conditions are as follows:

- Drywell pressure 1.8 psig
- The reactor has been Scrammed
- Reactor Pressure is 850 psig and steady
- RPV level is +34 inches and being maintained by Start-up Level Control
- Main Turbine is on the Turning Gear

A loss of 1AY160 occurs.

WHICH ONE of the following describes the pressure control method available based on the above conditions?

- a. Reactor Feed Pump Turbines
- b. EHC using Bypass Jack
- c. HPCI full flow test
- d. RHR Shutdown Cooling

Answer Key and Question Data

Question # 24	
Choice	Basis or Justification
a.	Correct. The RFP turbines are the only available method from the list given
b.	Loss of 1AY160 and low Main Turbine speed will deenergize ECH system logic. With a loss of logic power, EHC controls are deenergized.
c.	With 1.68 psig in the drywell the HPCI Full Flow test valve (HV-55-1F022) can not be opened
d.	Loss of 1AY160 will cause a SDC isolation

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		SRO

Source Documentation			
Source:	New Exam Item		
Reference(s):	E-1AY160		
Learning Objective:	LLOT0590.5		
Knowledge/Ability:	241000K6.17	Importance: RO 2.7 / SRO 2.8	
(Description of K&A, from catalog)			
Knowledge of the effect that a loss or malfunction of the Main turbine PMG will have on the Reactor/Turbine Pressure Regulator			

Prepared by: CBG

Question: 25

Unit 2 plant conditions are as follows:

- 100% Reactor Power
- Reactor Level +35 inches and stable
- Feedwater Level Control is in 3 element

The "2A" Feedwater Flow transmitter fails to 100%.

WHICH ONE of the following describes the response of RPV level based on automatic action only and the above conditions?

- a. Decreases and a reactor SCRAM on low level will occur
- b. Decreases and stabilizes at a new lower value
- c. Increases and a Turbine High level trip will occur
- d. Increases and stabilize at a new higher value

Question # 25	
Choice	Basis or Justification
a.	Incorrect, the failure of the feed flow transmitter level will only have a minimal effect on level. FWLC system is level dominant.
b.	Correct
c.	Incorrect, a feedwater flow transmitter failing high will cause the FWLC system to sense a increase in feedwater flow and will respond by reducing feed pump speed to lower feedwater flow. This will result in lower RPV level
d.	Incorrect, a feedwater flow transmitter failing high will cause the FWLC system to sense a increase in feedwater flow and will respond by reducing feed pump speed to lower feedwater flow. This will result in lower RPV level

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-100
Learning Objective:	LLOT0550.7B
Knowledge/Ability:	259001A3.03
	Importance: RO 3.3 / SRO 3.2
(Description of K&A, from catalog)	
Ability to monitor automatic operation of the Reactor Feed Water System including System Flow	

Prepared by: CBG

Question: 26

Unit 1 Plant conditions are as follows:

- "B" RERS train is in service for testing

A fire occurs in the "B" RERS filter. An Equipment Operator manually initiates the deluge fire suppression system for the "B" RERS filter train.

WHICH ONE of the following describes the effect on Unit 1 Reactor Enclosure contamination levels and the status of the "B" RERS filter train two (2) minutes later based on the above conditions?

	<u>Unit 1 Reactor Enclosure contamination level</u>	<u>"B" RERS filter train status</u>
a.	Remains constant	Isolated
b.	Increases	Isolated
c.	Remains constant	Not isolated
d.	Increases	Not isolated

Question # 26	
Choice	Basis or Justification
b.	Correct - contamination levels will rise since RERS will release air to the RE. The filter train will isolate upon deluge system initiation.
a-c-d	Incorrect

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	P&ID M-76, sh. 6
Learning Objective:	LLOT0200.01
Knowledge/Ability:	261000 K3.05
	Importance: RO 3.2 / SRO 3.5
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the STANDBY GAS TREATMENT SYSTEM will have on secondary containment radiation/contamination levels	

Prepared by: caf

Question: 27

Unit 2 plant conditions are as follows:

- D24 diesel generator (DG) testing is in progress
- During continuous manual load reduction, the PRO observes DG load drop from 1000 KW to zero KW and begin to indicate a slight rise again before the controls were released
- Reactive load is 100 KVAR
- Bus load is constant

WHICH ONE of the following actions should be taken to prevent a DG trip based on the above conditions?

- a. SPEED control to RAISE to increase KW load
- b. VOLTS control to RAISE to increase KW load
- c. SPEED control to LOWER to reduce KVAR load
- d. VOLTS control to LOWER to reduce KVAR load

Answer Key and Question Data

Question # 27

Choice	Basis or Justification
a.	Correct. The DG is in a reverse power condition for real and reactive load. The operator should raise real load using speed control
b.	Incorrect. Wrong control
c.	Incorrect. Wrong direction
d.	Incorrect. Wrong control and wrong direction

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	S92.2.N
Learning Objective:	LLOT0660.04
Knowledge/Ability:	264000A1.09
	Importance: 3.0 / 3.1
(Description of K&A, from catalog)	
Ability to predict and monitor changes in parameters associated with operating the EDG system controls including maintaining minimum load on the emergency generator (to prevent a reverse power trip)	

Prepared by: JMS

Question: 28

Unit 1 plant conditions are as follows:

- Shutdown is in progress
- Reactor Power is 11%
- A Withdraw Error exists on control rod 10-51 with the following information provided:

<u>Control Rod</u>	<u>Insert Limit</u>	<u>Withdraw Limit</u>
10-51	24	36

- No other RWM errors exists

WHICH ONE of the following describes the furthest withdrawn rod position where the Withdraw Error can be still corrected without bypassing the control rod or RWM based on the above conditions?

- a. 38
- b. 40
- c. 42
- d. 44

Answer Key and Question Data

Question # 28	
Choice	Basis or Justification
a.	Incorrect, a one notch position correction is permitted by the RMW. The Question specifically asks for the maximum correctable error, which would be two notch positions.
b.	Correct
c.	Incorrect, corrections can be made below the RWM LPSP to correct errors a maximum of two notch positions only.
d.	Incorrect, corrections can be made below the RWM LPSP to correct errors a maximum of two notch positions only.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO

Source Documentation	
Source:	New Exam Item
Reference(s):	
Learning Objective:	LLOT0095.3D
Knowledge/Ability:	2010065.10 Importance: RO 3.2 / SRO 3.3
(Description of K&A, from catalog)	
Knowledge of the operational implications of the following concepts as they apply to RWM system: Withdraw error	

Prepared by: CBG

Question: 29

Unit 1 plant conditions are as follows:

- OPCON 3
- "1A" RHR is in Shutdown Cooling

A recirculation pipe rupture results in RPV level dropping to -140 inches

WHICH ONE of the following describes the response of the "1A" RHR Shutdown Cooling and "1A" LPCI injection from the Suppression Pool based on the above conditions?

	<u>"1A" Shutdown Cooling Line-up</u>	<u>"1A" LPCI</u>
a.	Isolated	Injecting
b.	Aligned	Injecting
c.	Isolated	Not injecting
d.	Aligned	Not injecting

Question # 29	
Choice	Basis or Justification
a., b.,d	SDC will isolate when RPV level drops below +12.5 inches. The HV-51-1F008/9/15 (SDC isolation) valves will isolate. A LOCA will occur at -129 inches. With the "1A" RHR aligned for SDC there is no suction path for the "1A" RHR pump.
b.	
c.	Correct
d.	

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Information	
Source:	New Exam Item
Reference(s):	ON-121
Learning Objective:	LLOT0370.14A
Knowledge/Ability:	205000K5.02
	Importance: RO 2.8 / SRO 2.9
(Description of K&A, from catalog) Knowledge of the operational implications of the following concepts as they apply to Shutdown Cooling System: Valve operation	

Prepared by: CBG

Question: 30

Unit 1 plant conditions are as follows:

- 100% Power
- RPS testing is in progress

When a "B1" manual Scram is inserted Control Rod 30-31 Scrams to the OVERTRAVEL IN position

WHICH ONE of the following describes the status of the Full Core Display indication for Control Rod 30-31 based on the above conditions?

	<u>Blue Scram Indication</u>	<u>Green Rod Full In</u>
a.	ON	ON
b.	ON	OFF
c.	OFF	OFF
d.	OFF	ON

Question # 30	
Choice	Basis or Justification
a.	Correct
b-d	With RPS both channels deenergized Scram pilot solenoids valves will open causing both Scram inlet and outlet vales to open. This will result in the blue scram indication on the full core display illuminating. Overtravel in position will still illuminate the green rod in indicator.

Required Attachments or Reference	
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Psychometric			
Cognitive (H, L)	L		

Source Information	
Source:	New Exam Item
Reference(s):	S73.0.E
Learning Objective:	LLOT0080.2I
Knowledge/Ability:	214000K1.05
	Importance: RO 3.3 / SRO 3.3
(Description of K&A, from catalog) Knowledge of the physical connections and/or cause-effect relationships between RPIS and the following: Full Core Display	

Prepared by: CBG

Question: 31

Unit 1 plant conditions are as follows:

- A planned power reduction to 60% is in progress
- Control Rod 22-55 is selected
- Reactor Power has been reduced to 91% with flow
- RBM downscale alarm has annunciated

WHICH ONE of the following describes the reason for the alarm and the action to be taken based on the above conditions?

	<u>Reason for Alarm</u>	<u>Action</u>
a.	Localized reverse power effect	Bypass the Rod Block Monitor using Joystick
b.	Localized reverse power effect	Place RDCS Rod select key to "NO Rod Select" then restore
c.	RBM downscale trip setpoint reached	Bypass the Rod Block Monitor using Joystick
d.	RBM downscale trip setpoint reached	Place RDCS Rod select key to "NO Rod Select" then restore

Question # 31	
Choice	Basis or Justification
a.	Incorrect. Localized reverse power happens on power increase per the response instructions
b.	Incorrect, this only occurs when rod withdraw between position 44-48 is performed
c.	Incorrect. RBM bypass is not directed
d.	Correct per the response instructions

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Information	
Source:	New Exam Item
Reference(s):	MCR-ARC-108 D-4
Learning Objective:	LOT0280.8
Knowledge/Ability:	215002G2.4.31
	Importance: RO 3.1 / SRO 3.4
(Description of K&A, from catalog)	
Knowledge of annunciators, alarms, and indications, and the use of the response instructions	

Prepared by: CBG

Question: 32

Unit 1 plant conditions are as follows:

- Reactor Scrammed
- LOCA is in progress
- Reactor pressure 480 psig
- Reactor Level -108 inches
- Drywell pressure 8.6 psig
- "1A" and "1B" Loop of RHRSW is in service
- "1A" Loop of RHR is in Suppression Pool Cooling

Reactor pressure drops to 430 psig, all RHRSW Radiation monitors trip on the bus transfer.

WHICH ONE of the following describes the ability to cool the suppression pool and the operation of "1A" RHR Pump based on automatic action only and the above conditions?

	<u>Ability to Cool SP</u>	<u>"1A" RHR Pump Operation</u>
a.	Is maintained, RHRSW pumps will continue running	Trips and automatically restarts
b.	Is lost, RHRSW pumps will trip	Continues to run
c.	Is lost, RHRSW pumps will trip	Trips and automatically restarts
d.	Is maintained, RHRSW pumps will continue running	Continues to run

Answer Key and Question Data

Question # 32	
Choice	Basis or Justification
a-c-d	Incorrect, RHR SW pumps will trip on RAD Monitor trip, RHR pumps will continue to run
b.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	SE-10
Learning Objective:	LOT0370.17
Knowledge/Ability:	219000K3.01
	Importance: RO 3.9 / SRO 4.1
(Description of K&A, from catalog)	
Knowledge of the effect that a loss or malfunction of RHR/LPCI: Pool Cooling Mode system will have on Suppression pool temperature control	

Prepared by: CBG

Question: 33

Unit 2 plant conditions are as follows:

- Loss of coolant accident
- Drywell and suppression pool sprays have been in service per T-102, PRIMARY CONTAINMENT CONTROL for the past 5 minutes using RHR Pumps
- Containment water level has risen to 41 feet due to condensate injection
- Drywell pressure is 8 psig and slowly dropping

The CRS has directed the PRO to secure drywell sprays due to high containment water level

WHICH ONE of the following is the reason for securing drywell sprays based on the conditions above?

- a. The drywell spray header is submerged
- b. The suppression pool vent valves cannot be opened
- c. The drywell vacuum breakers are inoperative
- d. The evaporative cooling pressure drop will be excessive

Answer Key and Question Data

Question # 33	
Choice	Basis or Justification
a.	Incorrect. Spray header is in the drywell upper elevation. Plausible due to confusion with spray header at 49 feet
b.	Incorrect. The valves are covered but this is not why sprays are secured
c.	Correct. Drywell sprays are secured above 38.7 feet to preserve vacuum breaker operability
d.	Incorrect. Plausible because INITIATION in the unsafe region will result in excessive evaporative cooling pressure drop

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-102 Bases	
Learning Objective:	LLOT1560.04	
Knowledge/Ability:	226001K6.05	Importance: 3.4/3.6
(Description of K&A, from catalog)		
Knowledge of the effect that a loss or malfunction of suppression pool (level, temperature, pressure) will have on the RHR/LPCI Containment Spray Mode		

Prepared by: JMS

Question: 34

Unit 1 Plant conditions are as follows:

- A LOCA is in progress, with drywell pressure 18 psig
- "1A" RHR loop was placed in Suppression Pool Spray mode when RPV pressure was 425 psig
- "1A" RHR pump discharge pressure is 200 psig

WHICH ONE of the following describes the pressure at which LPCI injection valve HV-51-1F017 (OUTBOARD A) will open, and the resulting status and action for HV-51-1F024A (TEST RETURN) based on the above conditions?

	<u>HV-51-1F017A opening pressure</u>	<u>Status and Action for HV-51-1F024A</u>
a.	349 psig	Closed and should be manually opened
b.	349 psig	Open and should be manually closed
c.	274 psig	Closed and should be manually opened
d.	274 psig	Open and should be manually closed

Question # 34	
Choice	Basis or Justification
a-b-c	Incorrect
d.	Correct – HV-51-1F017A will open only when d/p is less than 74 psid, and HV-51-1F024A will only close on the LOCA signal, not when the 17 valve opens

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	E11-1040 prints, T-225
Learning Objective:	LLOT0370
Knowledge/Ability:	230000 A2.04
	Importance: RO 2.8 / SRO 3.1
(Description of K&A, from catalog)	
Ability to predict the impacts of valve openings on the RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE; and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.	

Prepared by: caf

Question: 35

Unit 2 plant conditions are as follows:

- Reactor Power 100%
- Air Ejector Discharge Rad Monitor Range switch in the Aux Equip Room is on Range 4

The Range switch is taken to the next higher range.

WHICH ONE of the following describes the effect on the Fine and Course Air Ejector Recorder indication in the Main Control Room based on the above conditions?

	<u>Fine Recorder Reading</u>	<u>Course Recorder Reading</u>
a.	Increases	Remains the same
b.	Increases	Decreases
c.	Decreases	Remains the same
d.	Decreases	Decreases

Answer Key and Question Bank

Question # 35	
Choice	Basis or Justification
a.	Incorrect, Fine Air Ejector reading will decrease when the range switch is taken to the next higher range. The range switch in the Aux. Equip. Room does not affect the Course Air Ejector reading.
b.	Incorrect, Fine Air Ejector reading will decrease when the range switch is taken to the next higher range. The range switch in the Aux. Equip. Room does not affect the Course Air Ejector reading.
c.	Correct
d.	Incorrect, Fine Air Ejector reading will decrease when the range switch is taken to the next higher range. The range switch in the Aux. Equip. Room does not affect the Course Air Ejector reading.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source: Question Bank		
Source:	New Exam Item	
Reference(s):		
Learning Objective:	LLOT0720.3H	
Knowledge/Ability:	239001A1.06	Importance: RO 3.4 / SRO 3.4
(Description of K&A, from catalog)		
Ability to predict and/or monitor changes in parameters associated with operating the Main and Reheat Steam system controls including Air ejector process radiation monitor		

Prepared by: CBG

Question: 36

Unit 2 Plant conditions are as follows:

- A startup is in progress
- Reactor power is 1%
- RPV pressure is 230 psig
- The Mechanical Vacuum Pump is in service drawing a vacuum on the main condenser
- All MSIVs are open

Main Steam Line radiation rises to five times normal full power background.

WHICH ONE of the following describes the resulting status of the Mechanical Vacuum Pump and MSIVs based on the above conditions?

	<u>Mechanical Vacuum Pump</u>	<u>MSIVs</u>
a.	Running	Closed
b.	Running	Open
c.	Tripped	Closed
d.	Tripped	Open

Question # 36	
Choice	Basis or Justification
a-b-c	Incorrect. Plausible distractors based on previous MSIV closure on high MSL rad.
d.	Correct – The Mechanical vacuum pump will auto trip if >3XNFPBG is reached. The MSIVs no longer automatically close on high MSL rad.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source / Documentation	
Source:	New Exam Item
Reference(s):	ARC-MCR-107, window I-1
Learning Objective:	LLOT0720.02
Knowledge/Ability:	272000 K4.02
Importance:	RO 3.7 / SRO 4.1

(Description of K&A, from catalog)
 Knowledge of RADIATION MONITORING system design features and/or interlocks which provide for automatic actions to contain the radioactive release in the event that the predetermined release rates are exceeded.

Prepared by: caf

Question: 37

Unit 2 Plant conditions are as follows:

- OPCON 5
- Core Alterations are in progress in the "A" quadrant
- The LSRO on the refueling platform informs the RO that a bundle is about to be lowered into the core.
- SRM count rates at the beginning of the CCTAS step are as follows:

"2A" SRM – 230 cps

"2B" SRM – 300 cps

"2C" SRM – INOP

"2D" SRM – INOP

WHICH ONE of the following SRM conditions would require the fuel handling crew to stop inserting the bundle into the core based on the above conditions?

- a. "2A" SRM – 290 cps
"2B" SRM – 500 cps
- b. "2A" SRM – 420 cps
"2B" SRM – 570 cps
- c. "2A" SRM – 470 cps
"2B" SRM – 520 cps
- d. "2A" SRM – 360 cps
"2B" SRM – 490 cps

Question # 37	
Choice	Basis or Justification
a.	Incorrect - no SRM count rates have doubled
b.	Incorrect - no SRM count rates have doubled
c.	Correct – this is the only choice that has an SRM (“2A”) that has had its count rate double.
d.	Incorrect - no SRM count rates have doubled

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	FH-105
Learning Objective:	LLOT0760.10
Knowledge/Ability:	234000 A4.01
	Importance: RO 3.7 / SRO 3.9
(Description of K&A, from catalog)	
Ability to manually operate and/or monitor in the control room: Neutron monitoring system.	

Prepared by: caf

Question: 38

Unit 2 plant conditions are as follows:

- Reactor Enclosure HVAC (REHVAC) is running
- The Equipment Operator (EO) has been given permission to swap the running "2A" REHVAC Exhaust Fan with the Standby "2B" REHVAC Exhaust Fan

One minute later, 20C205 HVAC PANEL TROUBLE and 20C206 HVAC PANEL TROUBLE alarms are received in the MCR and RE D/P indication is slowly dropping (less vacuum).

WHICH ONE of the following describes the indications and the reason based on the above conditions?

- a. The swap of exhaust fans is complete, but the EO needs to swap to the "B" train of REECE
- b. The swap of exhaust fans is complete, but the EO needs to swap to the "B" D/P control loop
- c. HVAC is tripped because the "2B" Exhaust Fan was started before the "2A" Exhaust Fan was secured
- d. HVAC is tripped because the "2A" Exhaust Fan was secured with the "2B" Exhaust Fan in OFF

Answer Key and Question Data

Question # 38

Choice	Basis or Justification
a.	Incorrect. The transfer should not cause the alarms given and either train of REECE can be run. D/P should not be degrading
b.	Incorrect. The transfer should not cause the alarms given, and either control loop will work. D/P should not be degrading
c.	Incorrect. The indications show HVAC tripped, but placing the oncoming fan in service is the normal method of executing the swap, and should not cause the indications shown
d.	Correct. Receipt of the given alarms and indications is evidence to the PRO that HVAC tripped during the swap. Less than 2 running exhaust fans will cause a trip of HVAC

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	S76.1.B
Learning Objective:	LLOT0200.08
Knowledge/Ability:	288000A4.01 Importance: 3.1/2.9
(Description of K&A, from catalog)	
Ability to manually operate and/or monitor from the control room Plant Ventilation, Start and Stop Fans	

Prepared by: JMS

Question: 39

You are about to take the shift as Unit RO/Unit Supervisor (as appropriate).

Your last shift was seven days ago.

WHICH ONE of the following describes the required log review that must be performed based on the above conditions?

- a. Must review the previous one day logs after completing turnover
- b. Must review the previous four days logs after completing turnover
- c. Must review the previous one day logs prior to completing turnover
- d. Must review the previous four days logs prior to completing turnover

Question # 39

Choice	Basis or Justification
a.	Incorrect – log review must be completed prior to turnover, not after, and is required back four days, not two.
b.	Incorrect – log review must be completed prior to turnover, not after.
c.	Incorrect – log review is required back four days, not two.
d.	Correct – OP-AA-112-101 requires log review through the last previous date on shift, or the preceding four days, whichever is less. Also requires the review to be performed prior to turnover

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L		

Source Documentation

Source:	New Exam Item		
Reference(s):	OP-AA-112-101		
Learning Objective:	LLOT1574		
Knowledge/Ability:	2.1.3	Importance:	RO 3.0 / SRO 3.4
(Description of K&A, from catalog) Knowledge of shift turnover practices			

Prepared by: caf

Question: 40

Unit 1 Plant conditions are as follows:

- A startup is in progress
- IRM "A" is reading 75 and slowly rising on Range 6

WHICH ONE of the following describes the required action, and the effect on IRM "A" indication based on the above conditions?

	<u>Move IRM "A" Range Select Switch to:</u>	<u>Approximate IRM "A" Indication</u>
a.	Range 7	7.5
b.	Range 5	7.5
c.	Range 7	24
d.	Range 5	24

Question # 40	
Choice	Basis or Justification
a.	Incorrect – Moving to range 7 will drop IRM “A” indication by a one-half decade, or by a factor of about 3.2. This will make IRM “A” indication read about 24, not 7.5.
b.	Incorrect – Moving to Range 5 will make cause IRM “A” to go to off scale high, and generate a half scram.
c.	Correct – Moving to Range 7 will lower indicated power to approximately 24/125 of scale, and prevent a rod block at 85/125.
d.	Incorrect – Moving to Range 5 will make cause IRM “A” to go to offscale high, and generate a half scram.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	GP-2, Appendix 1
Learning Objective:	LLOT0250.09
Knowledge/Ability:	2.2.2
	Importance: RO 4.0 / SRO 3.5
(Description of K&A, from catalog)	
Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	

Prepared by: caf

Question: 41

Unit 1 Plant conditions are as follows:

- A LOCA is in progress
- RPV pressure is 200 psig and lowering
- Suppression pool pressure is 59 psig and slowly rising
- Primary containment water level is 25 ft. and stable
- "1A" and "1B" RHR pumps are both inoperable
- Drywell spray is in service from RHRSW

The CRS has ordered drywell sprays secured to prevent exceeding the Primary Containment Pressure Limit.

WHICH ONE of the following describes the basis for this action based on the above conditions?

- a. Ensure SRVs remain operable
- b. Prevent damage to drywell unit cooler fans
- c. Prevent downcomer vacuum breakers from becoming inoperable
- d. Maintain adequate water inventory in the spray pond for ESW function

ANSWER KEY and CORRECTION SHEET

Question # 41	
Choice	Basis or Justification
a.	Correct – The SRVs need a d/p of 25 psid across the diaphragm to open. With a minimum of 85 psig Instrument gas pressure, the maximum containment pressure allowed is 60 psig to ensure SRVs will open.
b.	Incorrect – Unit cooler fans are secured prior to starting drywell sprays, and are not a concern after that.
c.	Incorrect – Downcomer vacuum breaker coverage only becomes a concern at a suppression pool water level of 38.7 ft.
d.	Incorrect – There is no concern of running out of water from the spray pond.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Identification	
Source:	New Exam Item
Reference(s):	T-102 TRIP Bases
Learning Objective:	LLOT1560.04
Knowledge/Ability:	2.4.6
	Importance: RO 3.1 / SRO 4.0
(Description of K&A, from catalog)	
Knowledge of symptom based EOP mitigation strategies.	

Prepared by: caf

Question: 42

Unit 1 plant conditions are as follows:

- Reactor SCRAM and spurious Main Steam Line isolation 60 minutes ago
- HPCI is inoperable
- RPV HIGH PRESSURE alarm is lit
- RPV level is 10 inches
- No reactor coolant system leaks exist

RCIC has been manually initiated and is injecting.

WHICH ONE of the following describes the subsequent level control that will be required based on the above conditions?

- a. Maximum CRD flow will be required along with RCIC to maintain level
- b. RCIC operation alone will be required to maintain RPV level
- c. Maximum allowed cooldown rate and injection with condensate will be required to maintain RPV level
- d. Re-opening of MSIVs and Reactor Feed Pump operation will be required to maintain RPV level

Answer Key and Question Data

Question # 42	
Choice	Basis or Justification
a.c.d	Incorrect. At any point 15 minutes or more after a SCRAM, RCIC is able to maintain level based on 600 gpm injection. Additional injection sources are not necessary
b.	Correct. The reason for RCIC operation under isolation conditions is to accommodate all makeup needs 15 minutes after a SCRAM

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	UFSAR
Learning Objective:	LLOT0380.01
Knowledge/Ability:	295007AK3.03
	Importance: 3.4/3.5
(Description of K&A, from catalog)	
Knowledge of the reason for RCIC operation as it applies to high reactor pressure	

Prepared by: JMS

Question: 43

Unit 2 plant conditions are as follows:

- Reactor SCRAM from 80% power
- RPV water level dropped to -15 inches and has begun to recover
- The Feed Water Master Level Controller is in AUTO and set for 40 inches
- No operator actions have been performed

WHICH ONE of the following is the value that the feed water control system will maintain and the controlling device that will maintain that value based on automatic actions and the above conditions?

	<u>RPV Level</u>	<u>Level Maintained By</u>
a.	20 inches	Master Level Controller
b.	20 inches	Startup Level Controller
c.	17.5 inches	Master Level Controller
d.	17.5 inches	Startup Level Controller

Answer Key and Question Data

Question # 43	
Choice	Basis or Justification
a, b, d.	Incorrect. The master level controller will reset to a setpoint of 17.5 inches automatically after RPV level drops below 12.5 inches. The startup level controller requires manual action to place in service, and requires manual action to adjust setpoint. Plausibility of 20 inches based on common misconception that setpoint setdown is variable at ½ of setpoint value.
c.	Correct. Design action of feed water control and the setpoint setdown feature designed to reduce the demanded level to reduce overshoot on level restoration

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	S06.0.E
Learning Objective:	LLOT0550.11
Knowledge/Ability:	295009AK2.02
	Importance: 3.9/3.9
Knowledge of the interrelations between reactor low water level and reactor water level control system	

Prepared by: JMS

Question: 44

Unit 2 plant conditions are as follows:

- Loss of feedwater heating at 85% power
- Reactor power increased to 102% before being reduced per OT-104, UNEXPECTED/UNEXPLAINED POSITIVE OR NEGATIVE REACTIVITY INSERTION
- 3D Monicore Case (P-1) indicates FLLLP is 1.000

WHICH ONE of the following describes the operational implications of the above conditions?

- a. Recirc flow must be reduced to make FLLLP greater than 1.000
- b. Recirc flow must be reduced to make FLLLP less than 1.000
- c. Control rods must be inserted to make FLLLP greater than 1.000
- d. Control rods must be inserted to make FLLLP less than 1.000

Answer Key and Question Data

Question # 44

Choice	Basis or Justification
a, b	Incorrect. Operators are required to reduce FLLLP. This can only be done by inserting rods
c.	Incorrect. Right method, but FLLLP needs to be reduced.
d.	Correct. Per GP-14 FLLLP is treated as a thermal limit and can only be addressed using control rods

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	GP-14, Resolution of Thermal Limits Violations		
Learning Objective:	LLOT1540.05		
Knowledge/Ability:	295014AK1.05	Importance:	3.7/4.2
(Description of K&A, from catalog) Knowledge of the operational implications of fuel thermal limits as they apply to inadvertent reactivity addition			

Prepared by: JMS

Question: 45

Unit 1 Plant conditions are as follows:

- Reactor power is 95% in end-of-cycle coastdown
- All control rods are fully withdrawn
- Both Reactor recirculation pumps are running at 100% speed
- All three sixth feedwater heaters have been removed from service four days ago

A feedwater heater tube leak results in a "2A" feedwater heater HI-HI level condition.

WHICH ONE of the following describes the expected feedwater heater isolation and the appropriate recirculation system action based on the above conditions?

	<u>Feedwater Heater Isolation</u>	<u>Reduce recirculation pump speed to maintain</u>
a.	"2A" heater ONLY	Less than 95% power
b.	"A" low pressure string	Less than 95% power
c.	"2A" heater ONLY	Less than 100% power
d.	"A" low pressure string	Less than 100% power

Question # 45

Choice	Basis or Justification
a.	Incorrect – the entire low pressure heater string will isolate, not just the “2A” heater.
b.	Correct – “2A” feedwater heater HI-HI level will cause a LP heater string isolation, and OT-104 requires reducing power to at or below the initial pre-transient level.
c.	Incorrect - the entire low pressure heater string will isolate, not just the “2A” heater, and power must be maintained less than or equal to 95%.
d.	Incorrect – power must be maintained less than or equal to 95%.

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	OT-104		
Learning Objective:	LLOT1540.02		
Knowledge/Ability:	295014 AA1.02	Importance:	RO 3.6 / SRO 3.8
(Description of K&A, from catalog)			
Ability to operate and/or monitor the following as they apply to INADVERTENT REACTIVITY			
ADDITION: Recirculation Flow Control System			

Prepared by: caf

Question: 46

Unit 2 plant conditions are as follows:

- ATWS in progress due to scram discharge volume being filled
- T-217, RPS/ARI RESET AND BACKUP METHOD OF DRAINING THE SDV is being performed
- All CRD HCU accumulators are depressurized and both CRD pumps are tripped
- RPV Pressure is 1000 psig
- RPV level is -60 inches
- The SDV Instrument Volume has been drained to 61%

A SCRAM has just been initiated by removing RPS jumpers

WHICH ONE of the following describes whether the SDV has adequate free volume to accept all the SCRAM water and whether rod motion will occur based on the above conditions?

	<u>SDV Free Volume</u>	<u>Rod Motion</u>
a.	Adequate	Will Occur
b.	Adequate	Will NOT Occur
c.	NOT Adequate	Will Occur
d.	NOT Adequate	Will NOT Occur

Answer Key and Question Data

Question # 46

Choice	Basis or Justification
a.	Correct per T-217
B,c,d	Incorrect. Adequate volume for all rods exists below 62%. Rod motion is expected for a reactor pressure-only SCRAM. Plausible distractors because HCU accumulators are depressurized.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	T-217
Learning Objective:	LLOT0060.09, LLOT1561.02
Knowledge/Ability:	295015AK2.01 Importance: 3.8/3.9
(Description of K&A, from catalog) Knowledge of the interrelations between incomplete SCRAM and CRD hydraulics	

Prepared by: JMS

Question: 47

Attachment Q47 is provided.

Unit 2 plant conditions are as follows:

- Drywell pressure is 45 psig and rising at 1 psig per minute
- Suppression Pool pressure is 49 psig
- Containment water level is 45 feet

The CRS has directed the PRO to vent the drywell per T-200, PRIMARY CONTAINMENT EMERGENCY VENT PROCEDURE.

WHICH ONE of the following is the corresponding vent path based on the above conditions?

- a. 2" Suppression Pool Vent
- b. 24" Suppression Pool Purge Exhaust
- c. 2" Drywell Vent
- d. 24" Drywell Purge Exhaust

ATTACHMENT Q47

PROCEDURE SECTION	SUPP POOL LEVEL (ft)	VENT
4.2 4.3	< 39	Suppression Pool
4.6 4.7	< 39 AND only if venting REGARDLESS of offsite release	
4.4 4.5	≥ 39	Drywell
4.8 4.9	≥ 39 AND only if venting REGARDLESS of offsite release	

NOTE

- For decay heat loads alone (Reactor Shutdown), it is expected that containment pressure rise will be relatively slow (i.e., 70 psig vent pressure will be reached in approximately 22 hours with no heat removal systems in service).
- IF** rate of pressure rise is significantly faster, **THEN** one **OR** more of the large vent paths (18"/24") should be established rapidly if permitted.
- The following sections provide instruction for Vent paths:

SECTION VENT PATH

- 4.2 2" Suppression Pool Vent
- 4.3 18" Suppression Pool Purge Exhaust
- 4.4 2" Drywell Vent
- 4.5 24" Drywell Purge Exhaust
- 4.6 24" Suppression Pool Purge Supply
- 4.7 6" ILRT Line From Suppression Pool
- 4.8 24" Drywell Purge Supply
- 4.9 6" ILRT Line From Drywell

Answer Key and Question Data

Question # 47

Choice	Basis or Justification
a.	Incorrect. No suppression pool venting above 39 feet.
b.	Incorrect. No suppression pool venting above 39 feet.
c.	The procedure requires a vent >2" based on the rate of pressure rise given.
d.	Correct. At level above 39 feet, vent from the drywell.

Required Attachments or Reference	Attachment Q47 T-200 portion for vent path assessment
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	T-200		
Learning Objective:	LLOT1561.03		
Knowledge/Ability:	295024 2.1.23	Importance:	3.9/4.0
(Description of K&A, from catalog) Ability to perform specific system and integrated plant procedures during different modes of plant operation			

Prepared by: JMS

Question: 48

Attachment Q48 is provided

Unit 1 plant conditions are as follows:

- A LOCA is in progress
- Reactor level –116 inches and lowering
- Drywell pressure is 15 psig and rising
- All RHR pumps are running
- Auto ADS has NOT been inhibited

LT-42-1N095A had failed to actuate on low level, all other level transmitters function as designed.

RPV Level drops to –135 inches.

WHICH ONE of the following describes the ability of Division I and Division III ADS to actuate in the Manual and Automatic modes based on the above conditions?

	<u>Division I ADS</u>	<u>Division III ADS</u>
a.	Both Auto and Manual	Both Auto and Manual
b.	Manual Only	Both Auto and Manual
c.	Both Auto and Manual	Manual Only
d.	Manual Only	Manual Only

ATTACHMENT Q48

TABLE II: SWITCH LEVEL INSTRUMENT UTILIZATION

TRANSMITTER NUMBER	DIV	POWER SUPPLY	TRIP FUNCTION	TRIP POINT
LT-1H000A	1A	K613A & E	LS-1M6300	3
LT-1H000B	1B	K613B & F	LS-1M6300	3
LT-1H000C	11A	K613A & E	RS-1M6300	3
LT-1H000D	11B	K613B & F	RS-1M6300	3
LT-1H001A	1A	K613A & E	LS-1M631A	2
LT-1H001B	1B	K613B & F	LS-1M631A	2
LT-1H001C	11A	K613A & E	LS-1M631C	2
LT-1H001D	11B	K613B & F	LS-1M631D	2
LT-1H005A	1	E11-K603A	---	1
LT-1H005B	2	E11-K603B	---	1
LT-1H001A	1	E21-K602A & E	LS-1M631A	1
LT-1H001B	2	E21-K602B & F	LS-1M631B	1
LT-1H001C	3	E21-K602C & G	LS-1M631C	1
LT-1H001D	4	E21-K602D & H	LS-1M631D	1
LT-1H001E	1	E21-K602A & E	LS-1M631E	1
LT-1H002A	1A	---	RS-1M630A	2
LT-1H002B	2A	---	RS-1M630B	2
LT-1H002C	3	---	RS-1M630C	2
LT-1H002D	4	---	RS-1M630D	2
LT-1H002E	1	K602A & E	---	---
LT-1H002F	2	K601	---	---
LT-1H002G	3	K603	---	---
LT-1H002H	4	C32-K611	---	---

TABLE II: PRESSURE INSTRUMENT UTILIZATION

TRANSMITTER NUMBER	DIV	POWER SUPPLY	TRIP FUNCTION	FUNCTION
PT-1H070A	1A	K613A & E	PS-1M670A	RPS
PT-1H070B	1B	K613B & F	PS-1M670B	MS4
PT-1H070C	11A	K613A & E	PS-1M670C	RPS
PT-1H070D	11B	K613B & F	PS-1M670D	MS4
PT-1H070E	1	E21-K602A & E	PS-1M670E	RPS
PT-1H070F	2	E21-K602B & F	PS-1M670F	MS4
PT-1H070G	3	E21-K602C & G	PS-1M670G	MS4
PT-1H070H	4	E21-K602D & H	PS-1M670H	MS4
PT-1H070I	1A	---	PS-1M670I	MS4
PT-1H070J	2A	---	PS-1M670J	MS4
PT-1H070K	3A	---	PS-1M670K	MS4
PT-1H070L	4A	---	PS-1M670L	MS4
PT-1H070M	1	E21-K602A & E	PS-1M670M	MS4
PT-1H070N	2	E21-K602B & F	PS-1M670N	MS4
PT-1H070O	3	E21-K602C & G	PS-1M670O	MS4
PT-1H070P	4	E21-K602D & H	PS-1M670P	MS4
PT-1H070Q	1A	---	PS-1M670Q	MS4
PT-1H070R	2A	---	PS-1M670R	MS4
PT-1H070S	3A	---	PS-1M670S	MS4
PT-1H070T	4A	---	PS-1M670T	MS4
PT-1H070U	1	K602A & E	---	---
PT-1H070V	2	K601	---	---
PT-1H070W	3	K603	---	---
PT-1H070X	4	C32-K611	---	---

Question # 48

Choice	Basis or Justification
a. c. d.	Loss of the LT-42-1F042A (ADS Confirmatory) only affects Division I ADS and does not affect the ability to manually initiate ADS. LT-42-1F042A has no effect on Division III ADS.
b.	Correct

Required Attachments or Reference	P&ID M-42
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	P&ID M-42
Learning Objective:	LLOT0330.5
Knowledge/Ability:	295031KEA1.06
	Importance: RO 4.4 / SRO 4.4
(Description of K&A, from catalog)	
Knowledge of the operational implication of the following concepts as they apply to Automatic depressurization system: Low water level	

Prepared by: CBG

Question: 49

Unit 1 plant conditions are as follows:

- ATWS in progress
- RPV water level has been intentionally lowered per T-270, TERMINATE AND PREVENT INJECTION INTO THE RPV to between -161 to -186 inches
- Current RPV level is -180 inches and steady
- RPV Pressure is 800 psig

WHICH ONE of the following lists the level instrument(s) that will be used to determine level in the control band above, and the method of core cooling at that level based on the above conditions?

	<u>Level Instrument Range</u>	<u>Core Cooling Method</u>
a.	Wide Range or Fuel Zone	Submergence only
b.	Wide Range or Fuel Zone	Submergence and Steam Flow
c.	Fuel Zone only	Submergence only
d.	Fuel Zone only	Submergence and Steam Flow

Answer Key and Question Data

Question # 49

Choice	Basis or Justification
a-b-c	Incorrect. Plausibility based on mis-diagnosis of level information and failure to recognize core uncover
d.	Correct. RPV water level has been lowered to below TAF per T-117. Only Fuel Zone range will be accurate under the given conditions. Significance of this level is that the core is cooled partially by steam cooling

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L		

Source Documentation

Source:	New Exam Item		
Reference(s):	T-117 bases		
Learning Objective:	LLOT0050.04, LLOT1560.05		
Knowledge/Ability:	295037EA2.02	Importance:	4.1/4.2
(Description of K&A, from catalog) Ability to determine and/or interpret RPV water level as it applies to SCRAM condition present and APRM power above APRM downscale or unknown			

Prepared by: JMS

Question: 50

Unit 2 plant conditions are as follows:

- Loss of Coolant Accident with significant core re-flood delay
- Drywell and Suppression Pool H_2 is 7%
- Drywell and Suppression Pool O_2 is 7%

WHICH ONE of the following is the status of the H_2 and O_2 atmospheric mixture and the method for removing the threat to containment integrity based on the above conditions?

	<u>Atmospheric Mixture</u>	<u>Method for Removal</u>
a.	Combustible	H_2O_2 recombiners and drywell mixing fans
b.	Combustible	High flow air purge of drywell
c.	NOT combustible	H_2O_2 recombiners and drywell mixing fans
d.	NOT combustible	High flow air purge of drywell

Answer Key and Question Data

Question # 50

Choice	Basis or Justification
a.c.d	Incorrect. The mixture exceeds combustibility limits and the control method is to clear the mixture with the most rapid method possible regardless of offsite release.
b.	Correct. Primary containment integrity is threatened and the control method specified ignition sources must be secured.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-102, PRIMARY CONTAINMENT CONTROL bases	
Learning Objective:	LLOT1560.05	
Knowledge/Ability:	500000EK2.01	Importance: 3.3/3.9
(Description of K&A, from catalog)		
Knowledge of the interrelations between High Containment Hydrogen Concentration and Containment Integrity		

Prepared by: JMS

Question: 76

Attachment Q76 is provided

Unit 2 plant conditions are as follows:

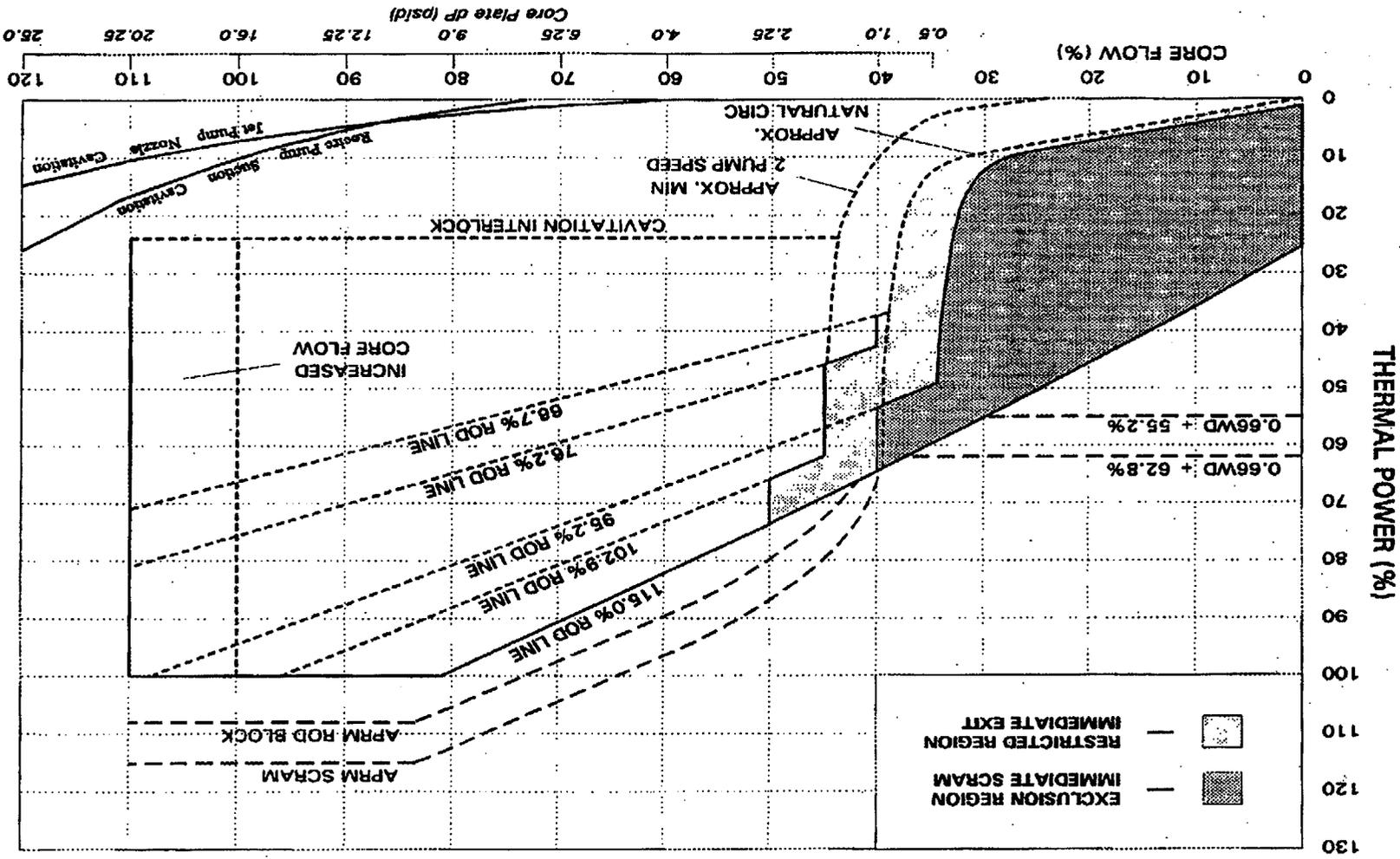
- 100% power
- 81% Flow

A spurious runback of both reactor recirculation pumps to 28% speed occurs.

WHICH ONE of the following is the approximate reactor power and flow value one minute later based on automatic actions and the above conditions?

	<u>Power (%)</u>	<u>Flow (%)</u>
a.	45	45
b.	45	28
c.	70	45
d.	70	28

LGS POWER FLOW OPERATION MAP



Question # 76	
Choice	Basis or Justification
a b d	Incorrect. The RO has not inserted rods; therefore, the answer must lie on or near the 115% rod line established in the initial conditions. Final flow will be above the natural circ line because some flow is still gained from pump operation. Plausible distractors matching speed to flow; a common misconception
c.	Correct per the power-to-flow map

Required Attachments or Reference	Attachment Q76: OT-112, RECIRCULATION PUMP TRIP Power to flow map with extra information removed
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-112, RECIRCULATION PUMP TRIP
Learning Objective:	LLOT0040.07b
Knowledge/Ability:	295001AK1.02
	Importance: 3.3/3.5
(Description of K&A, from catalog)	
Knowledge of the operational implications of core power/flow distribution as it applies to complete or partial loss of forced core circulation.	

Prepared by: JMS

Question: 77

Unit 1 plant conditions are as follows:

- 95% power
- Main condenser vacuum is 26 inches and slowly lowering
- Offgas guard bed flow is 300 scfm and rising slowly
- "1A" SJAE lineup is verified to be correct

WHICH ONE of the following describes the actions that are required and the component likely to be damaged under the above conditions per OT-116, LOSS OF CONDENSER VACUUM?

	<u>Actions Required</u>	<u>Threatened Component</u>
a.	Start Mechanical Vacuum Pump	High Pressure Turbine Blades
b.	Start Mechanical Vacuum Pump	Offgas guard bed
c.	Reduce power until vacuum stops dropping	High Pressure Turbine Blades
d.	Reduce power until vacuum stops dropping	Offgas guard bed

Answer Key and Question Data

Question # 77	
Choice	Basis or Justification
a.	Prohibited above 5% power
b.	Prohibited above 5% power
c.	Incorrect. The action is correct, but the lowering vacuum will not damage the HP Turbine blades.
d.	Correct. Immediate actions for OT-116, LOSS OF CONDENSER VACUUM. Per the procedure, the guard bed will be damaged above 300 scfm.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-116, LOSS OF CONDENSER VACUUM
Learning Objective:	LLOT1540.02
Knowledge/Ability:	295002AK1.04
	Importance: 3.0/3.3
(Description of K&A, from catalog)	
Knowledge of the operational implications of high offgas flow as it relates to loss of main condenser vacuum	

Prepared by: JMS

Question: 78

Unit 1 plant conditions are as follows

- 100% power
- "1B" Narrow Range level transmitter is failed upscale
- RPV level is +35 inches and stable

"1D" Narrow Range level transmitter spikes to +58 inches

WHICH ONE of the following describes Main Turbine status and Turbine Hi Level Trip Logic Indication on 10C603 panel based on the above conditions?

	<u>MAIN Turbine Status</u>	<u>TRIP LOGIC INDICATION "1B" and "1D" Lights</u>
a.	On-line	ON
b.	On-line	OFF
c.	Tripped	ON
d.	Tripped	OFF

Answer Key and Question Data

Question #78	
Choice	Basis or Justification
a-b-c	Incorrect, The turbine is tripped because the Main Turbine Trip Logic requires A <u>or</u> B <u>and</u> C <u>or</u> D high level transmitters to trip. The status of the trip logic is a recent plant mod. The indication is now "deenergize" to indicate actuation.
d.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Description	
Source:	New Exam Item
Reference(s):	GP-8.1
Learning Objective:	LLOT-560.9A.
Knowledge/Ability:	295008AK2.08
	Importance: RO 3.4 / SRO 3.5
(Description of K&A, from catalog)	
Knowledge of the interrelations between High Reactor Water Level and the following: Main Turbine	

Prepared by: CBG

Question: 79

Attachment Q79 is provided

Unit 1 plant conditions are as follows:

- Power reduction in progress for fuel failure
- WIDE RANGE ACCIDENT MONITOR HI RADIATION alarm has been received
- The RM-11 Grid 1 display is as shown on the attachment

WHICH ONE of the following describes the status of the WIDE RANGE ACCIDENT MONITOR (WRAM) indication based on the above conditions and the reason?

- a. Valid for gaseous activity and total effluent because the mid and high range gaseous monitors have not yet activated
- b. Valid for total effluent only. Gaseous activity is not valid because two of three channels are offline
- c. Valid for gaseous activity only. Total effluent reading is invalid because two of three gaseous activity channels are offline
- d. NOT valid for gaseous activity OR total effluent because two of three gaseous activity channels are offline

ATTACHMENT Q79

SELECT FUNC. KEY OR TURN-ON CODE LGSGRID

1 2 3 4 ALM

RE26076-1
1.000E-07
UC/ML

RE26076-2
2.277E-5
UC/ML

RE26076-3
1.000E-07
UC/ML

NORTH STACK VENT

RE26075A-1
3.310E-15
UC/ML

RE26075A-2
3.785E-14
UC/ML

RE26075A-3
1.837E-5
UC/ML

WIDE RANGE

NORMAL RANGE MONITOR A

RE26076-4
5.337E+4
UC/S

RE26075B-1
3.310E-15
UC/ML

RE26075B-2
3.785E-14
UC/ML

RE26075B-3
2.337E+4
UC/ML

MONITOR

NORMAL RANGE MONITOR B

RE26025-1
1.056E-11
UC/ML

RE26025-2
3.454E-12
UC/ML

HOT MAINTENANCE

SHOP

VENT MONITOR

UNIT 1

UNIT 2

RE26185A-1
3.351E-15
UC/ML

RE26185A-2
3.578E-14
UC/ML

RE26185A-3
1.968E-07
UC/ML

SOUTH STACK VENT

RE26285A-1
3.463E-12
UC/ML

RE26285A-2
2.972E-13
UC/ML

RE26285A-3
1.009E-06
UC/ML

MONITOR A

MONITOR A

RE26185B-1
3.351E-15
UC/ML

RE26185B-2
3.578E-14
UC/ML

RE26185B-3
1.968E-07
UC/ML

MONITOR B

RE26285B-1
3.235E-12
UC/ML

RE26285B-2
4.182E-13
UC/ML

RE26285B-3
8.791E-07
UC/ML

MONITOR B

PREV CANC

F1= CLEAR

F2= ACK GRID

F3= HISTORY

F4= CPU

F5=

F6=

TT011

WL= 003/w/n=1

SEC LVL= 0

PRIM/BACK

A

Limerick

Answer Key and Question Data

Question # 79

Choice	Basis or Justification
a.	Correct. The WRAM consists of three overlapping gaseous channels with only one on-line at a time. The Total Effluent channel combines the activity (uci/cc) of the online channel with the stack flow (cc/sec) to obtain uci/sec. The offline channels are expected to be blue.
b,c,d.	Incorrect. The common misconception is that the blue indication means the entire monitor is INOP.

Required Attachments or Reference	Attachment Q79: RM-11 Grid 1 screenshot with Low range yellow, hi and mid blue, and total effluent yellow. Normal range monitor gaseous channels yellow
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Psychometrics

Cognitive (H, L)	H		SRO

Source Documentation

Source:	New Exam Item		
Reference(s):	RMMS-402		
Learning Objective:	LLOT0762.05		
Knowledge/Ability:	295017AA1.04	Importance:	3.6/3.8
(Description of K&A, from catalog)			
Ability to operate and/or monitor the Stack Gas Monitoring System as is relates to High Offsite Release Rate			

Prepared by: JMS

Question: 80

Unit 2 plant conditions are as follows:

- 100% power
- "2A" Instrument Air Compressor is secured for maintenance
- "2A" Instrument Air Header indicates 92 psig on PI-15-220A
- "2B" Instrument Air Header indicates 102 psig on PI-15-220B

The "2B" Instrument Air Compressor trips and cannot be re-started, and the Operator observes the following:

- "2A" Instrument Air Header drops to zero psig
- "2B" Instrument Air Header drops to zero psig
- Service Air Header Pressure remains constant at 95 psig

WHICH ONE of the following describes the indications and the reason based on the above condition?

- a. Expected until manual action is taken to align the Service Air Compressor to supply Instrument Air
- b. Expected until manual action is taken to align the Backup Service Air Compressor to supply Instrument Air
- c. NOT expected because the "2A" header pressure should have remained nearly constant
- d. NOT expected because "2B" header and Service Air pressure should have dropped then stabilized at approximately 70 psig

Answer Key and Question Data

Question # 80	
Choice	Basis or Justification
a.	Incorrect. Service air backup is automatic
b.	Incorrect. Service air backup is automatic, and Backup Service Air is manually aligned
c.	Correct. The "A" header was already aligned with service air as a backup. No additional loads are operating or are imposed on the compressor.
d.	Incorrect. The B header is not normally aligned with service air as a backup. It will depressurize on a loss of instrument air

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	ON-119, "LOSS OF INSTRUMENT AIR"
Learning Objective:	LLOT0730.02
Knowledge/Ability:	295019AA1.01
	Importance: 3.5/3.3
(Description of K&A, from catalog) Ability to operate and/or monitor Backup Air Supply as it applies to Partial or Complete Loss of Instrument Air	

Prepared by: JMS

Question: 81

Unit 1 plant conditions are as follows:

- OPCON 2 with startup in progress
- RPV pressure is 500 psig
- "1A" CRD pump is out of service

The "1B" CRD Pump has tripped and the third ACCUM trouble lamp has been received. The CRS has directed an immediate manual reactor SCRAM.

WHICH ONE of the following describes the consequences of delaying the SCRAM based on the above conditions?

- a. Inadequate free volume could exist in the scram discharge volume
- b. Degradation of CRD seals due to lack of cooling water could reduce insertion times
- c. Randomly drifting rods could result in un-analyzed rod configurations
- d. Leakage from accumulators and low RPV pressure could prevent rod insertion

Answer Key and Question Data

Question # 81

Choice	Basis or Justification
a.	Incorrect. Reason for SDV scram setpoint.
b.	Incorrect. Consequence of loss of cooling and reason for minimizing time with CRD off.
c.	Incorrect. Consequence of low scram pilot air pressure.
d.	Correct. Basis for Tech Spec required scram below 900 psig with loss of all CRD.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	ON-107, "CONTROL ROD DRIVE SYSTEM PROBLEMS" Bases	
Learning Objective:	LLOT1550.02	
Knowledge/Ability:	295022AK3.01	Importance: 3.7/3.9
(Description of K&A, from catalog)		
Knowledge of the reason for Reactor SCRAM response as it applies to Loss of CRD Pumps		

Prepared by: JMS

Question: 82

Unit 2 plant conditions are as follows:

- ATWS in progress
- Reactor Power is 6%
- Suppression pool temperature is 109 °F

The Operator has manually started all Standby Liquid Control (SLC) Pumps.

WHICH ONE of the following is assured based on the above conditions?

- a. The ATWS will be terminated before the Pressure Suppression Pressure is exceeded
- b. The reactor will be subcritical before the Primary Containment Pressure Limit is reached
- c. The ATWS will be terminated before the suppression pool design temperature is exceeded
- d. The reactor will be subcritical before the Heat Capacity Temperature Limit is exceeded

Answer Key and Question Data

Question # 82	
Choice	Basis or Justification
a.b.c	Incorrect. The conditions are either independent of boron injection or can only be assured with all rods inserted. Common misconception is that an ATWS is terminated with SLC. All the distractors relate to heat addition and are plausible
d.	Correct. Basis for Boron Injection Initiation Temp

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	T-101, RPV CONTROL Bases
Learning Objective:	LLOT1560.05
Knowledge/Ability:	295026EK2.04
	Importance: 3.7/4.1
(Description of K&A, from catalog)	
Knowledge of the reason for SLC injection due to High Suppression Pool Water Temperature	

Prepared by: JMS

Question: 83

Attachment T-102 is provided.

Unit 2 plant conditions are as follows:

- All suppression pool level indications are off-scale high
- Suppression pool pressure is 43 psig
- Drywell pressure is 20 psig

ON BACK IN PLASTIC
SLEEVE FOR ALL
T-XX ATTACHMENTS

WHICH ONE of the following describes actual containment water level based on the above conditions?

- a. 52.9 feet
- b. 65.3 feet
- c. 79.7 feet
- d. 90.4 feet

Question # 83

Choice	Basis or Justification
a-b-d	Incorrect – distractors based on common errors in using the formula
c.	Correct – suppression pool pressure minus drywell pressure gives the pressure due to the height of water felt above the suppression pool pressure instrument. Converted to level, it equals 52.9 ft. Added to the height of the instrument (26.8 ft), gives a total level in the containment of 79.7 feet.

Required Attachments or Reference	T-102, PRIMARY CONTAINMENT CONTROL flowchart
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	T-102
Learning Objective:	LLOT1560.06
Knowledge/Ability:	295029 EA2.03 Importance: RO 3.4 / SRO 3.5
(Description of K&A, from catalog) Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL: drywell/containment water level	

Prepared by: caf

Question: 84

Unit 1 plant conditions are as follows:

- Leak from RHR suction
- Suppression pool level dropped to 16 feet before the leak was isolated
- A coolant leak from a recirc loop has developed
- Drywell pressure has risen to 15 psig
- Drywell and suppression pool sprays cannot be initiated

WHICH ONE of the following describes the approximate value of suppression chamber pressure as compared to drywell pressure based on the above conditions?

- a. 0 psi below drywell pressure
- b. 2 psi below drywell pressure
- c. 5 psi below drywell pressure
- d. 8 psi below drywell pressure

Question # 84	
Choice	Basis or Justification
a-c-d	Incorrect. 0 psid based on incorrect assumption of zero downcomer submergence 5 psid based on normal downcomer coverage of 12 feet 8 psid based on total pool static head and failure to include downcomer elevation
b.	Correct – downcomer elevation is 12 ft. The dp will be roughly 2 psid or 13 psig in the suppression pool. Diagnostic skill in predicting the expected containment performance under degraded conditions.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Information	
Source:	New Exam Item
Reference(s):	T-102
Learning Objective:	LLOT0130.06
Knowledge/Ability:	295030 EA2.04
	Importance: RO 3.5 / SRO 3.7
(Description of K&A, from catalog) Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: drywell/suppression chamber differential pressure	

Prepared by: caf

Question: 85

Attachment Q85 is provided

Unit 1 plant conditions are as follows:

- 100% power
- REACTOR ENCLOSURE AREA HI RADIATION alarm
- MCR multipoint radiation recorder RRM1-1R600 on 10C600 is INOP

The Equipment Operator has reported that the alarm is due to HPCI room radiation at 520 mR/hr

WHICH ONE of the following describes the method for determining HPCI room radiation levels, and whether entry to T-103, SECONDARY CONTAINMENT CONTROL is REQUIRED based on the above conditions?

	<u>HPCI Room Rad Reading</u>	<u>T-103 Entry Required</u>
a.	Aux Equip Room ARM Channels	Yes
b.	Aux Equip Room ARM Channels	No
c.	Locally at HPCI room ARM Only	Yes
d.	Locally at HPCI room ARM Only	No

ATTACHMENT Q85

RADIATION

DESCRIPTION	INSTRUMENT	MNO
		MSO
RCIC Pp Rm Area 15, Elev 177	RIS-01-M1-1K600	<u>HI ALARM</u> 10 ⁴ mr/hr
HPIC Pp Rm Area 15, Elev 177	RIS-02-M1-1K600	<u>HI ALARM</u> 10 ⁴ mr/hr
RHR Div 1 Rm Area 16 Elev. 201 (RHR A,C)	RIS-08-M1-1K600	<u>HI ALARM</u> 10 ⁴ mr/hr
RHR Div 2 Rm Area 16 Elev. 201 (RHR B,D)	RIS-09-M1-1K600	<u>HI ALARM</u> 10 ⁴ mr/hr
Stm Vent Air Stairwell Area 16 Elev. 217	RIS-10-M1-1K600	<u>HI ALARM</u> 10 ⁴ mr/hr
RCTR ENCLOSURE RAILRD Access air lock Area 16 Elev. 217 NOTE 3:	RIS-11-M1-1K600	<u>HI ALARM</u> 10 ⁴ mr/hr
RWCU HTX Area 15, Elev 283	RIS-21-M1-1K600	<u>HI ALARM</u> 10 ⁴ mr/hr
RWCU Pump Area Area 15, Elev 283	RIS-22-M1-1K600	<u>HI ALARM</u> 10 ⁴ mr/hr
Main Steam Chase	RR-41-1R603	<u>HI ALARM</u> 3 x NFPB

Answer Key and Question Data

Question # 85

Choice	Basis or Justification
a.	Correct. Readings can be obtained in the aux equipment room and HPCI Max Normal Op Rad Level is set at the alarm setpoint requiring entry to the TRIP procedure
b-c-d	Incorrect. Rad readings can be obtained from the AER, and entry to the TRIP is required above MNO Rad, which is at the alarm setpoint. Plausibility is due to confusion around alternate indication, and whether entry to the TRIP is required at MNO or MSO rad.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	T-103, SECONDARY CONTAINMENT CONTROL Bases, T-290
Learning Objective:	LLOT1560.02, LLOT0710.06
Knowledge/Ability:	295033EA2.01 Importance: 3.8/3.9
(Description of K&A, from catalog) Ability to determine and/or interpret area radiation levels as they relate to Secondary Containment Area High Radiation	

Prepared by: JMS

Question: 86

Unit 1 plant conditions are as follows:

- 100% power
- A Resin spill during backwash has occurred
- All Reactor Enclosure HVAC Exhaust Rad Monitors indicate 1.0 mR/hr and are slowly rising with "A" and "B" RE HVAC Exhaust Fans running

The PRO has armed and depressed HS-76-178B (HVAC ISOLATION) only

WHICH ONE of the following describes the resulting status of Reactor Enclosure Exhaust Fans and the location to obtain a valid reading of Reactor Enclosure Effluent radiation levels based on the above conditions?

	<u>RE Exhaust Fan Status</u>	<u>Effluent Rad Reading</u>
a.	All Tripped	North Stack Monitor
b.	All Tripped	South Stack Monitor
c.	"B" Tripped; "A" and "C" Running	North Stack Monitor
d.	"B" Tripped; "A" and "C" Running	South Stack Monitor

Answer Key and Question Data

Question # 86	
Choice	Basis or Justification
a.	Correct. The Division 2 series isolation valve closure will give a functional isolation and cause a trip of all fans. The ventilation flowpath moves the to the North stack through SGTS
b.c.d	Incorrect. All fans will be tripped and the the RE Exh Rad Monitors will still indicate exhaust activity. Plausible distractors because the HVAC exhaust path swaps from south stack to north stack on an isolation

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	
Learning Objective:	LLOT0200.07
Knowledge/Ability:	295038EA1.06
	Importance: 3.5/3.6
(Description of K&A, from catalog)	
Ability to operate and/or monitor the Plant Ventilation system as it applies to High Offsite Release Rate	

Prepared by: JMS

Question: 87

Unit 1 plant conditions are as follows:

- Manually Scrammed from 80% power
- Fire in the cable spreading room
- A RCIC high RPV level shutdown signal is being caused by fire-induced damage to the cabling
- D11 Bus has a fault lockout due to cable damage

The CRS has directed the crew to evacuate the MCR and execute SE-1, REMOTE SHUTDOWN and all remote shutdown transfer switches have been placed to EMERGENCY.

WHICH ONE of the following describes whether RCIC will be used for cooldown and whether shutdown cooling can be placed in service from the remote shutdown panel (RSP) based on the above conditions?

	<u>Cooldown from Rated Pressure</u>	<u>SDC Control from the RSP</u>
a.	Control of RCIC regained for cooldown from RSP	Can be placed in service
b.	Control of RCIC regained for cooldown from RSP	Cannot be placed in service
c.	RCIC unavailable. Alternate systems required	Can be placed in service
d.	RCIC unavailable. Alternate systems required	Cannot be placed in service

Answer Key and Question Data

Question # 87

Choice	Basis or Justification
a-c-d	Incorrect. RSP is designed for allowing SSD during fire; however, alternate shutdown cooling will be required per SE-6, alternate remote shutdown
b.	Correct. The remote shutdown design basis includes AER logic failures. RCIC control is regained. The fire-induced loss of D11 will result in the need for alternate shutdown cooling

Required Attachments or Reference	
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Psychomotor Abilities

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	SE-1, REMOTE SHUTDOWN;		
Learning Objective:	LLOT0735.01, 04		
Knowledge/Ability:	600000AA2.04	Importance:	2.8/3.1
(Description of K&A, from catalog)			
Ability to determine and /or interpret the fire's extent of potential operational damage to plant equipment			

Prepared by: JMS

Question: 88

Attachment Q88 is provided

Unit 2 plant conditions are as follows:

- Steam leak in the Reactor Enclosure (RE)
- XR-42-1R623B (B PAMS) is the only RPV level instrument indicating in the MCR
- XR-42-1R623B indicates –130 inches
- Outboard MSIV Room 518 Temperature is 200 °F
- HPCI room temperature is at the Max Normal Operating Temp
- Reactor Enclosure dp has dropped to 0.1 inches WG

The CRS has directed an Emergency Blowdown.

WHICH ONE of the following is the reason for conducting the emergency blowdown based on the above conditions?

- a. MSIV solenoids are not operable
- b. RPV water level is unknown
- c. Steam chase blowout panels have actuated
- d. HPCI operation is threatened

ATTACHMENT Q88

INSTRUMENTATION AFFECTED BY HIGH TEMPERATURE

(< MRT OR > MIL: usable)
 (> MRT AND < MIL: not usable)

WIDE RANGE (- 150" to + 60")						
INSTRUMENT (location)	TRANSMITTER	MRT	MIL	LEG	AREA/ INSTRUMENT PATHS	ATTACH
XR-42-1R623B (10C601)	LT-42-115B	181°F	- 124"	Ref (Low)	12/253'	4
					11/12/253' Rm 407 OB MSIV Rm	4
					11/12/283' Rm 518 OB MSIV Rm	5
					11/12/295' Rm 523 CS Inj Vlv Rm	5
					Pen X-65A Az: 4° Elev: 304'	5 & 6
				Var (High)	12/253'	4
					11/12/253' Rm 407 OB MSIV Rm	5
					11/12/283' Rm 518 OB MSIV Rm	5
					Pen X-20A Az: 30° Elev: 284'	5 & 6

Answer Key and Question Data

Question # 88	
Choice	Basis or Justification
a.	Incorrect. The first lift setpoint is 1170, and by itself exceeding SRV setpoints does not require an emergency Blowdown
b.	Correct. RPV water level indication above the MRT and below MIL. The reason for the blowdown is RPV water level is unknown
c.-	Incorrect. The blowout panels have not actuated yet
d	Incorrect. HPCI operation is not threatened until exceeding the Max Safe Op Temp. Even if HPCI is threatened, a blowdown is not warranted based on HPCI impact alone

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	T-103, SECONDARY CONTAINMENT CONTROL bases
Learning Objective:	LLOT1560.05
Knowledge/Ability:	295032EK3.01
	Importance: 3.5/3.8
(Description of K&A, from catalog) Knowledge of the reason for conducting Normal/Emergency Depressurization as it relates to High Secondary Containment Temperature	

Prepared by: JMS

Question: 89

Unit 2 plant conditions are as follows:

- Steam leak in the RCIC room
- RCIC room pressure rose and then stabilized due to blowout panel actuation
- The steam leak is not isolated

WHICH ONE of the following describes the location where steam will be directed and whether the radioactivity in the release can be monitored from the Main Control Room based on the above conditions?

	<u>Release Point</u>	<u>Monitoring Status</u>
a.	South RE wall from the Safeguard Valve Room (376)	Monitored
b.	South RE wall from the Safeguard Valve Room (376)	Unmonitored
c.	North Stack from the Main Steam Chase	Monitored
d.	North Stack from the Main Steam Chase	Unmonitored

Answer Key and Question Data

Question # 89

Choice	Basis or Justification
a.	Incorrect. The release is unmonitored.
b.	Correct. The steam will blow upward into the 376 room, which in turn will blow out the South wall. The release is unmonitored
c.	Incorrect. Plausible based on valid blowout path for the main steam lines, but not HPCI or RCIC Rooms.
d.	Incorrect. Plausible based on valid blowout path for the main steam lines, but not HPCI or RCIC Rooms.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-104, RADIOACTIVITY RELEASE	
Learning Objective:	LLOT0190.07	
Knowledge/Ability:	295035EK2.04	Importance: 3.3/3.7
(Description of K&A, from catalog)		
Knowledge of the interrelations between Secondary Containment High Differential Pressure and Blowout Panels		

Prepared by: JMS

Question: 90

Unit 2 plant conditions are as follows:

- Loss of Coolant Accident during refueling from a Shutdown Cooling rupture
- Reactor Enclosure (RE) flooding on EL 177'
- The Operator is performing T-236, TRANSFERRING REACTOR ENCLOSURE FLOOR DRAIN SUMP TO SUPPRESSION POOL VIA CORE SPRAY SYSTEM
- RE FLOOR DRAIN SUMP PUMP HI HI LVL alarm is annunciated

The Operator has placed HSS-61-204, "Rx Encl Floor Drain Sump Pumps Selector Sw," at 20C452 to HI HI Rad

WHICH ONE of the following describes the subsequent operation of the RE Floor Drain Sump Pumps based on the above conditions?

- a. Runs continuously regardless of sump level and trips on Radwaste Enclosure Exhaust HI HI rad
- b. Auto stops and starts on sump level and trips on Radwaste Enclosure Exhaust HI HI rad
- c. Runs continuously regardless of sump level and trips on drywell post-LOCA rad monitor HI HI rad
- d. Auto stops and starts on sump level and runs regardless of drywell post-LOCA rad monitor readings

Answer Key and Question Data

Question # 90	
Choice	Basis or Justification
a-b-c	Incorrect. The switch bypasses only the drywell post loca rad monitor trip. Common misconception about the function of the switch. Plausible distractor with RW HVAC because the reason for pumping to the supp pool is to minimize release from RW HVAC
d.	Correct. Per T-236

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	T-236
Learning Objective:	LLOT1561.01
Knowledge/Ability:	295036EA1.01
	Importance: 3.2/3.3
(Description of K&A, from catalog)	
Ability to operate and/or monitor the Secondary Containment and Floor Drain System with Secondary Containment High Sump/Area Water Level	

Prepared by: JMS

Question: 91

Plant conditions are as follows:

- A pump room has general area dose rates ranging from 1 mrem/hr to 10 mrem/hr
- Contamination levels are 2000 dpm/100cm²

WHICH ONE of the following lists the area posting for the pump room per RP-AA-376, RADIOLOGICAL POSTINGS, LABELING, AND MARKINGS based on the above conditions?

- a. Radiation Area and Contamination Area
- b. Radiation Area and Red Zone
- c. High Radiation Area and Contamination Area
- d. High Radiation Area and Red Zone

Answer Key and Question Data

Question # 91	
Choice	Basis or Justification
a.	Correct.
b-c-d	Incorrect. High rad area starts at 100 mr/hr. Red zone starts at 500,000 dpm/100cm ²

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	2002 LSRO exam.
Reference(s):	RP-AA-376
Learning Objective:	LLOT1760.03
Knowledge/Ability:	2.3.1
	Importance: 2.6/3.0
(Description of K&A, from catalog)	
Knowledge of 10CFR20 and related facility radiation control requirements.	

Prepared by: JMS

Question: 92

Unit 2 plant conditions are as follows:

- 100% power
- Drywell pressure has risen from 0.6 psig to 0.9 psig over the past two hours

The CRS has directed the drywell to be vented per OT-101, HIGH DRYWELL PRESSURE.

WHICH ONE of the following describes the reason for using the vent path associated with the above conditions?

- a. Ensure REECE will reduce activity released and allow for monitoring at the South Stack
- b. Ensure SGTS will reduce the activity released and allow for monitoring at the South Stack
- c. Ensure REECE will reduce the activity released and allow for monitoring at the North Stack
- d. Ensure SGTS will reduce the activity released and allow for monitoring at the North Stack

Answer Key and Question Data

Question # 92	
Choice	Basis or Justification
a.	Correct
b, c, d	Incorrect. The reason for venting via the 2" vent path is to send the activity through the REECE charcoal filters and out the South Stack monitoring point. Common misconception tested as to the vent path and monitoring point

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-101, "HIGH DRYWELL PRESSURE"
Learning Objective:	LLOT1540.05
Knowledge/Ability:	295010AK3.01
	Importance: 3.8/4.0
(Description of K&A, from catalog) Knowledge of the reason for drywell venting as it pertains to high drywell pressure	

Prepared by: JMS

Question: 93

WHICH ONE of the following describes the sequence of actuation for Alternate Rod Insertion (ARI) and Recirc Pump Trip (RPT) when actuated on high RPV pressure?

	<u>ARI</u>	<u>RPT</u>
a.	Immediately	After nine seconds
b.	Immediately	Immediately
c.	After nine seconds	After nine seconds
d.	After nine seconds	Immediately

Answer Key and Question Data

Question # 93

Choice	Basis or Justification
a-c-d.	Incorrect. High reactor pressure causes immediate ARI and RPT. Plausibility of distractor is because low level trip inserts a 9 second time delay on the RPT breaker trip.
b.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	GP-18, CRIB Op-Aid
Learning Objective:	LLOT0315.04
Knowledge/Ability:	295025EK2.04
	Importance: 3.9/4.1
(Description of K&A, from catalog) Knowledge of the interrelations between high reactor pressure and ARI/RPT/ATWS	

Prepared by: JMS

Question: 94

Unit 1 plant conditions are as follows:

- Loss of offsite power with failure of all diesel generators

The CRS has directed the PRO to determine RPV level and pressure.

WHICH ONE of the following describes the locations to obtain the readings based on the above conditions?

	<u>RPV LEVEL</u>	<u>RPV PRESSURE</u>
a.	Div 1 PAMS Level	Narrow Range on 10C603
b.	Div 1 PAMS Level	HPCI Steam Line Pressure
c.	Wide Range on 10C603	Narrow Range on 10C603
d.	Wide Range on 10C603	HPCI Steam Line Pressure

Answer Key and Question Data

Question # 94	
Choice	Basis or Justification
a-b-c	Incorrect. The PAMS are safety related, but not DC powered. Narrow range pressure is not available.
d.	Correct per E-1, "STATION BLACKOUT"

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	E-1, "STATION BLACKOUT",
Learning Objective:	LLOT0050.10
Knowledge/Ability:	295003AA2.02 Importance: 4.2/4.3
(Description of K&A, from catalog) Ability to determine and/or interpret reactor power, pressure, and level during Partial or Complete Loss of AC Power	

Prepared by: JMS

Question: 95

Unit 1 plant conditions are as follows:

- The control room has been evacuated per SE-1, REMOTE SHUTDOWN
- All remote shutdown transfer switches are in EMERGENCY
- RCIC is injecting and "A" RHR is in suppression pool cooling mode

A loss of Division 1 DC power occurs

WHICH ONE of the following lists the status of RCIC and suppression pool cooling one minute later based on automatic actions and the above conditions?

	<u>RCIC</u>	<u>Suppression Pool Cooling</u>
a.	Injecting	Operating
b.	Injecting	NOT Operating
c.	NOT Injecting	Operating
d.	NOT Injecting	NOT Operating

Answer Key and Question Data

Question # 95	
Choice	Basis or Justification
A b d	Incorrect. RCIC will stop running because the flow controller loses power. RHR will continue running because the breaker has received no trip signal, and the trip coil requires the now lost DC control power.
c.	Correct: RCIC stops running and SP/Cooling continues running

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	E-1FA SE-1
Learning Objective:	LLOT0690.06
Knowledge/Ability:	295004AA1.02
	Importance: 3.8/4.1
(Description of K&A, from catalog) Ability to operate and/or monitor systems necessary for safe shutdown as they relate to a partial or complete loss of DC power	

Prepared by: JMS

Question: 96

Unit 1 plant conditions are as follows:

- Drywell temperature is 140 °F
- Drywell pressure is 1.0 psig
- OT-101, HIGH DRYWELL PRESSURE is being executed
- The CRS has directed the PRO to maximize drywell cooling

WHICH ONE of the following describes the fans and chilled water pumps that should be placed in service per OT-101, HIGH DRYWELL PRESSURE based on the above conditions?

	<u>Drywell Fans</u>	<u>Drywell Chilled Water Pumps</u>
a.	One fan per cooler	One
b.	One fan per cooler	Two
c.	Two fans per cooler	One
d.	Two fans per cooler	Two

Answer Key and Question Data

Question # 96	
Choice	Basis or Justification
a.	Incorrect. Plausible because only one fan and one chiller are required, however two chilled water pumps are required.
b.	Correct per the OT-101 Bases
c.	Incorrect. Plausible because two fans appear to cool better and the procedure requires only one chiller (but two pumps).
d.	Incorrect. Plausible because two fans and two chilled water pumps appear to cool better.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-101, HIGH DRYWELL PRESSURE
Learning Objective:	LLOT1540.02
Knowledge/Ability:	295012AK2.01
	Importance: 3.4/3.5
(Description of K&A, from catalog)	
Knowledge of the interrelations between high drywell temperature and drywell ventilation	

Prepared by: JMS

Question: 97

Unit 1 plant conditions are as follows:

- 90% power
- "1K" SRV has opened for 30 seconds and re-closed
- Suppression pool temperature is 87 °F and rising

WHICH ONE of the following describes the suppression pool cooling (SP/C) loops and RHRSW pumps required to be operated per OT-114, INADVERTANT OPENING OF A RELIEF VALVE based on the above conditions?

	<u>SP/C Loops Required</u>	<u>RHRSW Pumps Required</u>
a.	One loop	One per loop
b.	One loop	Two per loop
c.	Two Loops	One per loop
d.	Two Loops	Two per loop

Answer Key and Question Data

Question # 97	
Choice	Basis or Justification
a,b,d	Incorrect. The immediate operator actions require two loops of SP/C. Only one of two 100% capacity RHRSW pump per loop is required. Two per loop are operated only if RHR HX operation is required on the other unit.
c.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-114, INADVERTANT OPENING OF A RELIEF VALVE
Learning Objective:	LLOT1540.02
Knowledge/Ability:	295013AK2.01 Importance: 3.6/3.7
(Description of K&A, from catalog) Knowledge of the interrelations between high suppression pool temperature and suppression pool cooling	

Prepared by: JMS

Question: 98

Unit 2 plant conditions are as follows:

- Reactor power 80%
- Drywell cooling is maximized

An inadvertent inboard low RPV water level isolation signal is received by the drywell chilled water system.

WHICH ONE of the following describes the status of drywell chilled water service to the drywell one minute later and the ability to bypass the signal and restore full drywell cooling based on the above conditions?

	<u>Drywell Chilled Water Currently In Service</u>	<u>Ability to Restore Full Drywell Cooling</u>
a.	"B" Loop Only to the drywell	Can be bypassed and restored
b.	"B" Loop Only to the drywell	CANNOT be bypassed and restored
c.	No loops in service to the drywell	Can be bypassed and restored
d.	No loops in service to the drywell	CANNOT be bypassed and restored

Answer Key and Question Data

Question # 98	
Choice	Basis or Justification
a.	Incorrect. Both loops are isolated. Plausible because inboard might correspond to loop A only
b.	Incorrect. The isolation can be bypassed
c.	Correct. The signal will isolate the inboard valves for both the "A" and "B" loops. The isolation can be bypassed and full cooling restored
d.	Incorrect, the isolation can be bypassed

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	GP-8
Learning Objective:	LLOT0180.08
Knowledge/Ability:	295020AA1.02
	Importance: 3.2/3.2
(Description of K&A, from catalog)	
Ability to operate and /or monitor Drywell Ventilation/Cooling System as it applies to Inadvertent Containment Isolation	

Prepared by: JMS

Question: 99

WHICH ONE of the following describes the reason for maintaining drywell temperature less than 340 °F per T-102, PRIMARY CONTAINMENT CONTROL?

- a. ADS will be available for emergency blowdown
- b. RPV level instruments will be available after the blowdown
- c. Instrument Gas compressors will continue to supply SRV pneumatics
- d. Drywell spray evaporative cooling pressure drop will not be excessive

Answer Key and Question Data

Question # 99

Choice	Basis or Justification
a.	Correct. Basis for drywell design temperature.
b	Incorrect. Depressurization with high drywell temp can result in flashing.
C	Incorrect. Trip at 160 °F suction temp.
d	Incorrect. Drywell spray initiation curve basis and currently unsafe to spray.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation			
Source:	LGS 2001 NRC		
Reference(s):	T-102, PRIMARY CONTAINMENT CONTROL bases		
Learning Objective:	LLOT1540.05		
Knowledge/Ability:	295028 2.1.32	Importance:	3.4/3.8
(Description of K&A, from catalog)			
Ability to explain and apply system limits and precautions			

Prepared by: JMS

Question: 100

Unit 1 plant conditions are as follows:

- OPCON 4
- "1A" RHR is in Shutdown Cooling
- No Reactor Recirc Pumps are running

The "1A" RHR Pump trips.

WHICH ONE of the following RPV level indications provides assurance that proper natural circulation will exist per S51.8.B SHUTDOWN COOLING/REACTOR COOLANT CIRCULATION OPERATION START-UP AND SHUTDOWN based on the above conditions?

- a. Upset level indication at 70 inches
- b. Shutdown level indication at 68 inches
- c. Wide Range level indication at 54 inches
- d. Narrow range level indication at 54 inches

Question # 100	
Choice	Basis or Justification
b.	Correct per S51.8.B
a. c. d.	Incorrect, in order for natural circulation flow to occur, RPV level must be above the spill-over point of the steam separators. This occurs at an indication of 78 inches on Upset or 60 inches on Shutdown

Required Attachments or Reference	
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System Attributes			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	S51.8.B.
Learning Objective:	LLOT0370.13C
Knowledge/Ability:	295021AK1.04
	Importance: RO 3.6 / SRO 3.7
(Description of K&A, from catalog) Knowledge of the operational implication of the following concepts as they apply to Loss of Shutdown Cooling: Natural circulation	

Prepared by: CBG

Question: 51

Unit 1 Plant conditions are as follows:

- 100% reactor power
- Both reactor recirculation pumps are running at 80% speed

The "2A" reactor recirculation pump MG set drive motor breaker trips. No operator actions are taken.

WHICH ONE of the following describes the expected indications for the "2A" reactor recirculation pump MG set five minute later based on the above conditions?

	<u>Scoop Tube "DEMAND" meter</u>	<u>Manual Control Station output meter</u>
a.	80	20
b.	40	20
c.	80	80
d.	40	80

Answer Key and Question Data

Question # 51 (RO)

Choice	Basis or Justification
a.	Incorrect - demand will go to 40% (startup signal generator) due to field breaker opening on interlock, and controller output will remain at 80%.
b.	Incorrect – controller output will remain at 80%.
c.	Incorrect – demand will go to 40% (startup signal generator) due to field breaker opening on interlock
d.	Correct – with the drive motor breaker tripped, the field breaker trips on interlock. The field breaker opening causes the DEMAND to be from the startup signal generator, which gives a demand signal of 40%. The controller output will remain at 80% since it is manually controlled only.

Required Attachment or Reference	None
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	S43.1.A		
Learning Objective:	LLOT0040.02		
Knowledge/Ability:	202002 A3.03	Importance: RO 3.1 / SRO 3.0	
(Description of K&A, from catalog) Ability to monitor automatic operations of the RECIRCULATION FLOW CONTROL SYSTEM including: scoop tube operation			

Prepared by: caf

Question: 52

Unit 2 plant conditions are as follows:

- LOCA is in progress
- RPV Level is -122 inches and lowering
- Drywell pressure is 14 psig and rising
- Reactor pressure is 510 psig and lowering
- Normal electrical line up

RPV level drops to -132 inches.

WHICH ONE of the following describes the response of the RHR Pumps based on the above conditions?

- a. C and D start immediately, A and B start after 5 seconds
- b. A and B start immediately, C and D start after 5 seconds
- c. All RHR pumps start immediately
- d. All RHR pumps start after 7 seconds

Answer Key and Question Data

Question # 52 (RO)	
Choice	Basis or Justification
a.	Correct
b.	Incorrect, dedicated LPCI pumps start first (C and D), five seconds later, A and B pumps start.
c.	Incorrect, dedicated LPCI pumps start first (C and D), five seconds later, A and B pumps start.
d.	Incorrect, all four LPCI pumps will automatically if off site power was not available.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	SE-10
Learning Objective:	LLOT0370.7
Knowledge/Ability:	203000A3.08
	Importance: RO 4.1 / SRO 4.1
(Description of K&A, from catalog) Ability to monitor automatic operations of the RHR/LPCI: Injection Mode system: including System initiation sequence	

Prepared by: CBG

Question: 53

Unit 2 plant conditions are as follows:

- Reactor startup is in progress
- All IRMs are on Range 2
- Control Rod withdraw to criticality is in progress

The "2B" IRM fails downscale

WHICH ONE of the following describes the response of the RDCS based on the above conditions?

- a. Insert Block will occur
- b. Withdraw Block will occur
- c. RDCS Inop will occur
- d. Both Insert and Withdraw Blocks will occur

Answer Key and Question Date

Question # 53 (RO)

Choice	Basis or Justification
a., c.,d.	Incorrect, IRMs on range 2 with "2B" IRM failing downscale (<5 not on Range 1) will result in a rod withdraw block. Only the RWM can generate an Insert Block. RDCS will on "INOP" on a failure of its self diagnostics and is not affected by IRM status
b.	Correct

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L		

Source Documentation

Source:	New Exam Item		
Reference(s):	S73.0.B.		
Learning Objective:	LLOT0080.6		
Knowledge/Ability:	215000K3.02	Importance:	RO 3.6
(Description of K&A, from catalog)			
Knowledge of the effect that a loss or malfunction of the IRM system will have on the following: Reactor Manual Control			

Prepared by: CBG

Question: 54

Unit 1 plant conditions are as follows:

- Reactor is shut down
- HPCI and RCIC are running and injecting
- RPV Level is +40 inches and rising

RPV level reaches +56 inches

WHICH ONE of the following describes how the RCIC Turbine is protected under the conditions above?

- a. HV-50-1F045 (INLET) valves closes
- b. HV-50-1F112 (THROTTLE) valve closes
- c. HV-49-1F007 (INBOARD) and 1F008 (OUTBOARD) closes
- d. HV-50-1F112 (TRIP) valve closes

Answer Key and Question Data

Question # 54 (RO)	
Choice	Basis or Justification
a.	Correct
b., c., d.	Incorrect, RCIC High level Shutdown will occur at +54", which will close the HV-50-1F045A (Inlet). The HV-50-1F112 valves will only trip on an actual turbine trip signal. +54" is not a turbine trip but a high level shutdown. A high level trip has not effect on RCIC isolation.
Required Attachment or Reference	

Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	S49.1.C
Learning Objective:	LLOT0380.7C
Knowledge/Ability:	217000K4.04
	Importance: RO 3.0 / SRO 3.1
(Description of K&A, from catalog) Knowledge of RCIC system design feature(s)) and/or interlocks which provide for the following: Prevents Turbine damage	

Prepared by: CBG

Question: 55

Unit 1 plant conditions are as follows:

- OPCON 3
- Shutdown cooling was being placed in service
- HV-51-1F024B (B LOOP RHR FULL FLOW TEST) failed to close while flushing
- RPV water level is +5 inches and lowering

SPDS isolation status flag shows GROUP NOT ISOL with a red border

WHICH ONE of the following is the indicated status of the Shutdown Cooling NS4 isolation logic and the isolation based on the above conditions?

- a. One of two level instruments tripped, and an isolation signal was NOT generated
- b. Logic is tripped, and isolation valves closed, but the required coincidence is NOT met
- c. Logic is tripped, and the isolation time limit has NOT expired
- d. Logic is tripped, and the inboard and outboard isolation valves failed to close within the time limit

Answer Key and Question Data

Question # 55 (RO)

Choice	Basis or Justification
a.	Incorrect. Logic failing to trip would leave the flag in the green status since no isolation command is present
b.	Incorrect. This status is essentially isolation success. The logic is tripped and the valves are closed. Status would be GROUP ISOL and green
c.	Incorrect. With an isolation in progress and the timer running, the status indicator is GROUP ISOL and yellow.
d.	Correct. The status flag is red when BOTH valves in a line fail to close after a time limit and an isolation signal is present

Required Attachment or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	Direct Exam Bank (LO Requal)
Reference(s):	
Learning Objective:	LLOT0180.06
Knowledge/Ability:	223002A1.03 Importance: 2.5/2.8
(Description of K&A, from catalog)	
Ability to predict and/or monitor changes in parameters associated with operating the PCIS/Nuclear Steam Supply Shutoff system controls including SPDS/ERIS/CRIDS/GDS	

Prepared by: JMS

Question: 56

Attachment Q56 is provided

Unit 1 plant conditions are as follows:

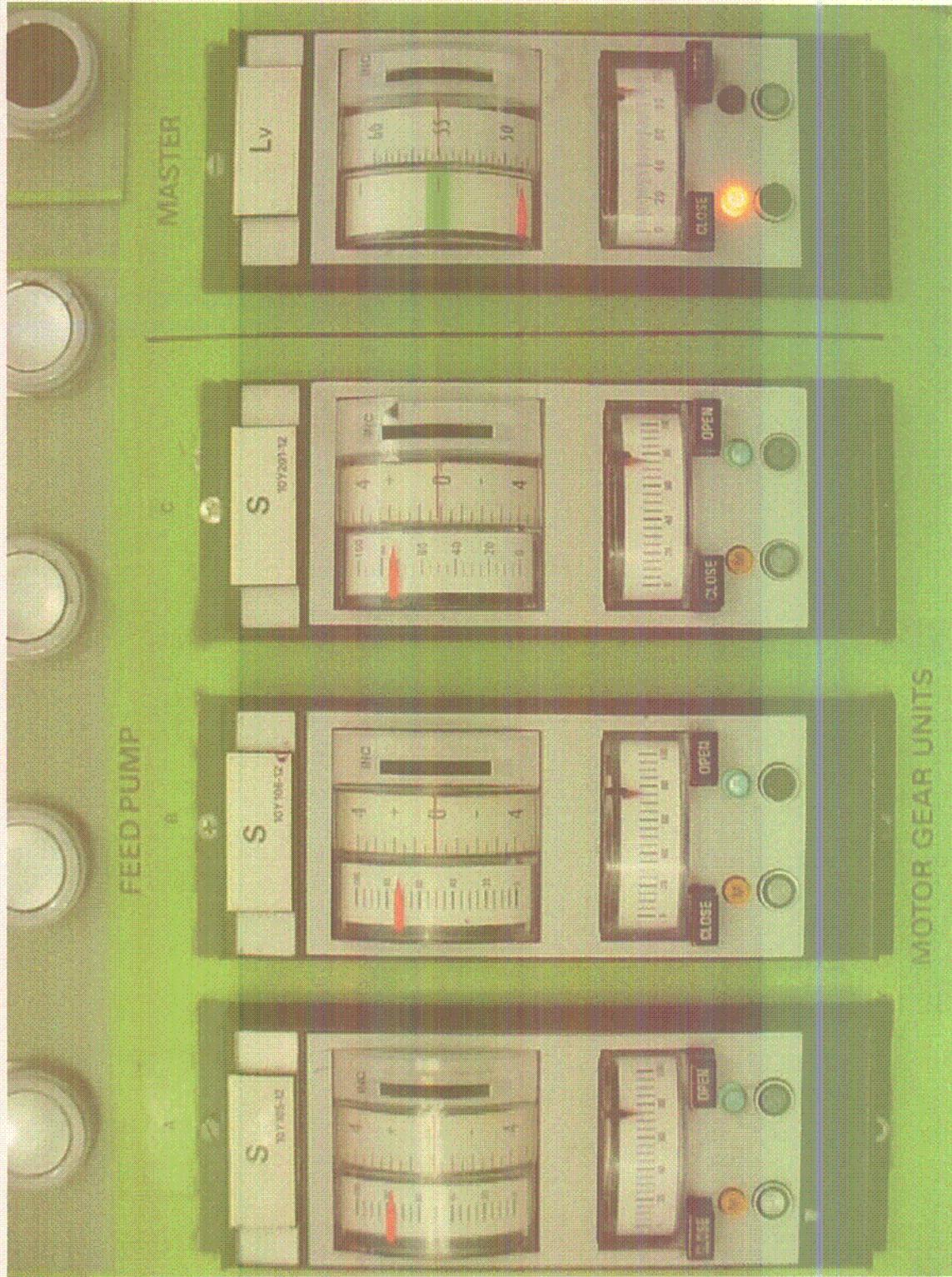
- Transfer of feedwater control from Manual to Automatic is in progress per S06.0.E, FEEDWATER LEVEL CONTROL AND REACTOR FEED PUMP CONTROL SYSTEM MANIPULATION
- Indications are as shown in Attachment Q56

The Operator is about to place the Master Level Controller in AUTOMATIC

WHICH ONE of the following describes the response of the Reactor Feed Pumps when the AUTO pushbutton is depressed based on the above conditions?

- a. Increase speed and trip on high RPV water level
- b. Increase speed and control at 55% of scale (35 inches)
- c. Decrease speed and control at 55% of scale (35 inches)
- d. Decrease speed until the reactor scrams on low level

ATTACHMENT Q56



Answer Key and Question Data

Question # 56 (RO)

Choice	Basis or Justification
a.	Correct.
b-c-d	Incorrect. The indications are that the master setpoint is set too high. Placing to AUTO will cause the master to attempt to control at 55 inches. Feed pumps trip at +54. The setup shown could reasonably occur following a low level transient where the operator recovered by increasing setpoint and then placing in manual. Plausible distractors based on mis-interpreting the indications

Required Attachment or Reference	Attachment Q56. Photo of Master and MGUs. All MGUs in AUTO. Master in manual with setpoint dialed to 55 inches with actual level 35 and deviation indicating below green band.
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Psychometrics			
Cognitive (H, L)	H		SRO

Source Documentation		
Source:	New Exam Item	
Reference(s):	S06.0.E	
Learning Objective:	LLOT0550.08	
Knowledge/Ability:	259002K5.01	Importance: 3.1/3.1
(Description of K&A, from catalog) Knowledge of the operational implications of the following concepts as they apply to Reactor Water Level Control: GEMAC/Foxboro/Bailey controller operation.		

Prepared by: JMS

Question: 57

Unit 2 Plant conditions are as follows:

- Both reactor recirculation pumps are initially operating at 60% speed
- An inadvertent runback signal causes the "2A" Reactor Recirculation Pump MG set to automatically reduce speed to 42%.
- Following the inadvertent runback, "2A" and "2B" Reactor Recirculation Pump MG set parameters are as follows:

	<u>"2A" MG set</u>	<u>"2B" MG set</u>
Generator speed	42%	60%
Generator voltage	2415 volts	2415 volts
Generator frequency	24.1 Hz	34.5 Hz

WHICH ONE of the following describes the status of the "2A" and "2B" Reactor Recirculation Pump MG set voltage regulators based on the above conditions?

	<u>"2A" MG set voltage regulator</u>	<u>"2B" MG set voltage regulator</u>
a.	Functioning properly	Functioning properly
b.	Not Functioning properly	Functioning properly
c.	Functioning properly	Not Functioning properly
d.	Not Functioning properly	Not Functioning properly

Answer Key and Question Data

Question # 57 (RO)

Choice	Basis or Justification
a.	Incorrect
b.	Correct – “2B” MG set voltage regulator is functioning properly, with 70 volts per Hertz. “2A” did not reduce voltage as frequency dropped, and is therefore not functioning properly (should have reduced voltage to 1690 volts)
c.	Incorrect
d.	Incorrect
Required Attachment or Reference	None

Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	S43.1.A		
Learning Objective:	LLOT0030.02		
Knowledge/Ability:	202001 K4.06	Importance:	RO 2.6 / SRO 2.7

(Description of K&A, from catalog)

Knowledge of RECIRCULATION system design features and/or interlocks which provide for the following: automatic voltage/frequency regulation

Prepared by: caf

Question: 58

Unit 2 plant conditions are as follows:

- 100% Power
- A steam leak has developed in the "2A" RWCU Heat Exchanger and "2A" RWCU Pump Rooms
- Division 1 and Division 4 Steam Leak Detection Alarms have annunciated
- RWCU has isolated

The Equipment Operator reports the following:

- "2A" RWCU Pump Room temperature 140 °F and stable
- "2A" RWCU Heat Exchanger Room temperature 137 °F and stable
- "2A" RWCU Heat Exchanger Room Delta T 10 °F and stable
- "2A" RWCU Pump Room Delta T 26 °F and stable

WHICH ONE of the following describes the isolation setpoint that was exceeded based on the above conditions?

- a. "2A" RWCU Pump Room temperature
- b. "2A" RWCU Heat Exchanger Room temperature
- c. "2A" RWCU Heat Exchanger Room Delta T
- d. "2A" RWCU Pump Room Delta T

Answer Key and Question Data

Question # 58 (RO)

Choice	Basis or Justification
a., c. d.	Incorrect, Pump Room High Temperature will cause a RWCU isolation at 142°F, Heat exchanger room high temperature will cause a RWCU isolation at 132°F, Heat exchanger and pump room Delta T will cause a RWCU isolation at 32°F
b.	Correct

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L		

Source Documentation

Source:	New Exam Item		
Reference(s):	GP-8.1		
Learning Objective:	LLOT110.6A		
Knowledge/Ability:	204000K1.15	Importance:	RO 3.1 / SRO 3.2
(Description of K&A, from catalog) Knowledge of the physical connections and/or cause-effect relationships between RWCU and the following: Leak Detection			

Prepared by: CBG

Question: 59

Unit 1 plant conditions are as follows:

- OPCON 2 at 5% power
- HP turbine shell warming in progress
- #2 Stop Valve poppet is open
- Turbine first stage pressure is 95 psig and rising at 5 psig per minute

WHICH ONE of the following describes the plant response within the next 30 minutes based on the above conditions?

- a. Full SCRAM due to control valve position
- b. Full SCRAM due to stop valve position
- c. Half SCRAM only due to control valve position
- d. Half SCRAM only due to stop valve position

Answer Key and Question Data

Question # 59 (RO)

Choice	Basis or Justification
a.c.d	Incorrect. Full scram at 190 psig. This scenario describes plausible operator error based on plant experience
b.	Correct. When first stage pressure reaches 190 psig, the stop valve closure scram will be un-bypassed and a full scram will result

Required Attachment or Reference	
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	GP-2, "NORMAL PLANT STARTUP" Appendix 3		
Learning Objective:	LLOT0300.07		
Knowledge/Ability:	245000 K3.07	Importance:	3.6/3.7
(Description of K&A, from catalog) Knowledge of the effect of a loss or malfunction of the Main Turbine Generator and Auxiliaries will have on the Reactor Protection System			

Prepared by: JMS

Question: 60

Unit 1 plant conditions are as follows:

- 15% power
- 1AY160 is de-energized
- Remaining Electrical Systems are in a normal line-up

A loss of 1BY160 occurs during the investigation

WHICH ONE of the following describes the Main Steam Line Isolation Valve (MSIV) position one minute later and the reason based on the above conditions?

	<u>MSIV Position</u>	<u>Reason</u>
a.	All MSIVs OPEN	Inboard and outboard MSIVs each have a DC pilot valve still energized
b.	All MSIVs OPEN	The pneumatic accumulators are NOT yet depleted after 1 minute
c.	All MSIVs CLOSED	AC and DC pilot valves on all MSIVs are de-energized from isolation signals
d.	All MSIVs CLOSED	Inboard and outboard MSIVs each have an AC or a DC pilot valve still energized

Answer Key and Question Data

Question # 60 (RO)

Choice	Basis or Justification
a-b-d	Incorrect. Full MSIV isolation will occur. Plausible distractors because LGS uses diverse AC and DC power supplies to MSIV pilot valves. Under certain power loss conditions, the MSIVs will remain open.
c.	Correct. Regardless of the availability of DC power to the pilot valves, the loss of AC has caused Div 1 and 2 isolation signals

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	E-1AY160, E-1BY160, GP-8		
Learning Objective:	LLOT0180.08		
Knowledge/Ability:	262002K3.11	Importance:	2.8/2.9
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the uninterruptible power supply (AC or DC) will have on the MSIVs			

Prepared by: JMS

Question: 61

WHICH ONE of the following describes the monitoring location for determining the average pretreatment radioactivity release rates in GP-5, POWER OPERATION , and the reason for performing the routine calculation?

	<u>Location</u>	<u>Reason</u>
a.	Between SJAE and Holdup Pipe	Monitor N-16 level for H2 injection setting
b.	Between SJAE and Holdup Pipe	Monitor fission product release for fuel clad integrity
c.	Between Charcoal Filters and HEPA filter	Monitor N-16 level for H2 injection setting
d.	Between Charcoal Filters and HEPA filter	Monitor fission product release for fuel clad integrity

Answer Key and Question Data

Question # 61 (RO)

Choice	Basis or Justification
a.	Incorrect. H2 setting not based on holdup pipe inlet
b.	Correct per GP-5
c.	Incorrect. Wrong location
d.	Incorrect. Wrong location

Required Attachment or Reference	
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	GP-3, "NORMAL PLANT SHUTDOWN"		
Learning Objective:			
Knowledge/Ability:	271000K6.09	Importance:	3.4/3.6
(Description of K&A, from catalog)			
Knowledge of the effect that a loss or malfunction of fuel cladding integrity will have on offgas			

Prepared by: JMS

Question: 62

Plant conditions are as follows:

- Both CREFAS subsystems are OPERABLE
- "A" CREFAS fan handswitch is in AUTO
- "B" CREFAS fan handswitch is in STBY
- A manual chlorine isolation has been initiated on all four channels per S78.8.A, MANUAL INITIATION OF CONTROL ROOM RADIATION OR CHLORINE/TOXIC CHEMICAL ISOLATION .

The "C" chlorine isolation channel failed to trip.

WHICH ONE of the following describes the status of the "A" and "B" CREFAS fans two minutes later based on the above conditions?

	<u>"A" CREFAS fan</u>	<u>"B" CREFAS fan</u>
a.	Running	Running
b.	Not running	Running
c.	Running	Not running
d.	Not running	Not running

Answer Key and Question Data

Question # 62 (RO)

Choice	Basis or Justification
a.	Incorrect
b.	Correct – the C channel starts the A fan. If the C channel fails to trip, the A fan will not start. The B fan, which will get a start signal from the D channel, will start in STBY after a time delay
c.	Incorrect
d.	Incorrect

Required Attachment or Reference	None
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Psychometrics

Cognitive (H, L)	H		

Source Documentation

Source:	New Exam Item		
Reference(s):	E-495 sh. 1, E-496 sh. 1		
Learning Objective:	LLOT0450.04		
Knowledge/Ability:	290003 A4.01	Importance: RO 3.2 / SRO 3.2	
(Description of K&A, from catalog)			
Ability to manually operate and/or monitor in the control room: initiate/reset system			

Prepared by: caf

Question: 63

Unit 2 plant conditions are as follows:

- Refueling is in progress
- RPV level is 497 inches on SHUTDOWN Range
- The reactor cavity to fuel pool gates are removed

Reactor Cavity seals #3 and #4 have depressurized.

WHICH ONE of the following describes the point at which RPV level will automatically stop lowering, and the status of the Fuel Pool Cooling pumps at that point based on automatic actions and the above conditions?

	<u>Point at which RPV level will automatically stop lowering</u>	<u>Fuel Pool Cooling Pumps</u>
a.	RPV flange	Tripped
b.	Bottom of transfer canal	Tripped
c.	RPV flange	Running
d.	Bottom of transfer canal	Running

Answer Key and Question Data

Question # 63 (RO)

Choice	Basis or Justification
a.	Correct – with both seals 3 and 4 depressurized, water will drain to the top of the RPV flange. This is below the level of the skimmer surge tank inlet weirs, which will cause fuel pool cooling pumps to trip of low skimmer surge tank level.
b-c-d	Incorrect. The level will drop to the flange. Plausible based on the lowest level in the fuel pool

Required Attachment or Reference	None
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Psychometrics

Cognitive (H, L)	L		

Source Documentation

Source:	New Exam Item		
Reference(s):	M-53 prints		
Learning Objective:	LLOT0750.08		
Knowledge/Ability:	233000 K6.10	Importance: RO 2.9 / SRO 3.3	
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the following will have on the FUEL POOL COOLING AND CLEANUP: Reactor cavity seal failure			

Prepared by: caf

Question: 64

Unit 2 plant conditions are as follows:

- Reactor was scrammed several hours ago for outage and pressure was held at 351 psig for one hour
- At 1400 a cooldown was commenced at a constant rate of pressure drop starting from 351 psig using the bypass valves (BPV)
- The cooldown rate limit in use is the Tech Spec limit

The RO notes at 1445 that RPV pressure is 103 psig

WHICH ONE of the following describes the status of cooldown rate and the required action per GP-3, NORMAL PLANT SHUTDOWN based on the above conditions?

	<u>Cooldown Rate Limit</u>	<u>Required Action</u>
a.	Has already been exceeded	Reduce EHC Pressure Set
b.	Has already been exceeded	Reduce BPV jack setting
c.	Will be exceeded if action is not taken	Reduce EHC Pressure Set
d.	Will be exceeded if action is not taken	Reduce BPV jack setting

Answer Key and Question Data

Question # 64 (RO)

Choice	Basis or Justification
a.	Has not been exceeded yet. Wrong action for EHC. Will not reduce cooldown rate
b.	Has not been exceeded yet. Right action
c.	Wrong action for EHC. Will not reduce cooldown rate
d.	<p>Correct. $351 \rightarrow 103$ psig = 366 psia $\rightarrow 118$ psia. Page 8 of Stm Tbl shows 436 °F $\rightarrow 340$ °F in 45 minutes</p> <p>Plant is within 4 °F of limit with 15 minutes to go. Limit has not been exceeded but will if action is not taken. Pressure will be 35 psia (5.5lb/min) and temp will be 260 °F (cooldown of 176 °F /hr)</p>

Required Attachment or Reference	Steam Tables
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Psychometrics

Cognitive (H, L)	H		
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Source Documentation

Source:	New Exam Item		
Reference(s):	GP-3, "NORMAL PLANT SHUTDOWN"		
Learning Objective:	LLOT0010.06		
Knowledge/Ability:	290002A2.04	Importance:	3.7/4.1
(Description of K&A, from catalog) Ability to predict the impacts of Excessive Heatup/Cooldown Rates on Reactor Vessel Internals, and use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations			

Prepared by: JMS

Question: 65

Attachment Q65 is provided.

Unit 1 plant conditions are as follows:

- OPCON 2
- Reactor Startup is in progress
- Reactor Pressure 900 psig
- "1B" RFP is being placed in service per S06.1.C, PLACING A STANDBY REACTOR FEED PUMP IN SERVICE

"1B" RFP parameters are as follows:

- Discharge pressure 1000 psig
- HV-06-108B, (DISCH) Discharge valve is closed
- Speed is 3000 rpm
- FV-C-06-106B, "RFP Recirculation Valve" (RECIRC), is set at 33%

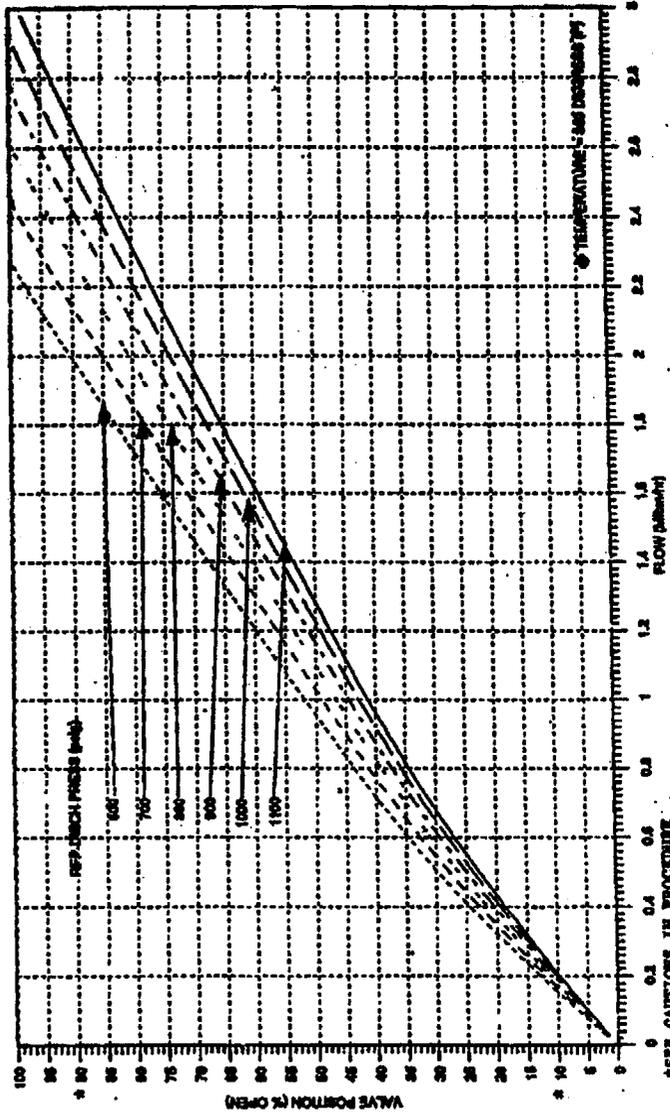
WHICH ONE of the following describes the action to be taken to operate the "1B" feed pump Min Flow in the "Optimum Efficient Region" based on the above conditions?

- a. Lower "1B" RFP RPM to 2800
- b. Raise FV-C-06-106B to 43%
- c. Lower "1B" RFP RPM to 2500
- d. Raise FV-C-06-106B to 55%

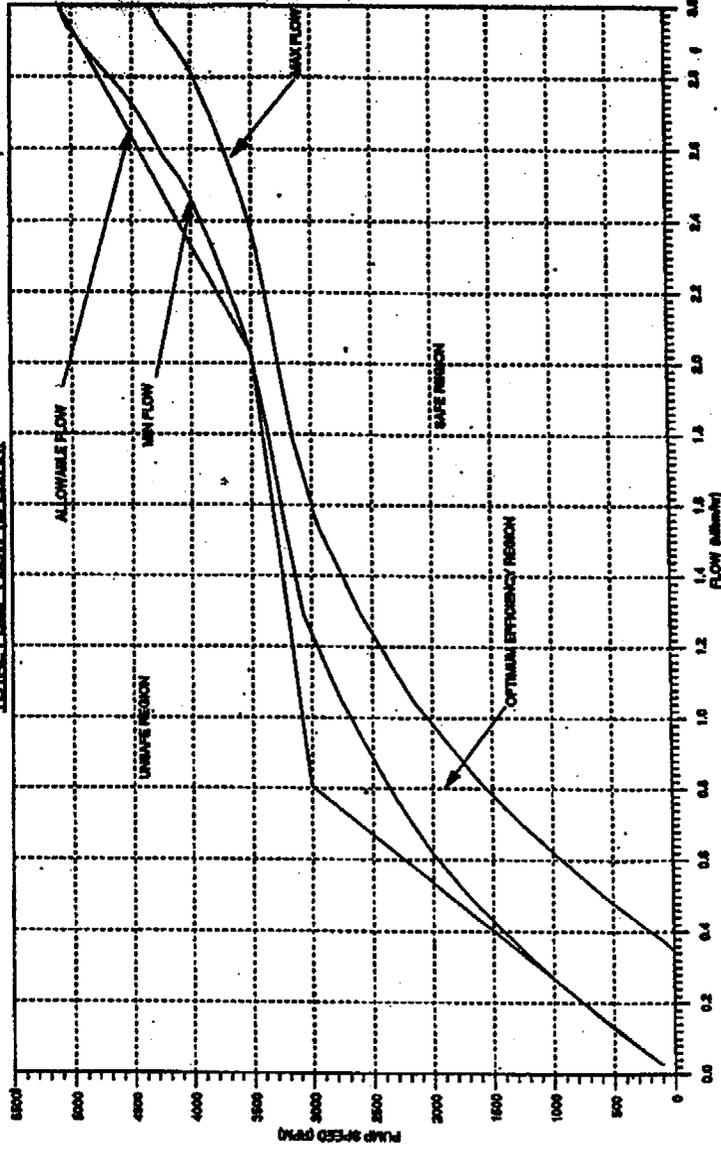
ATTACHMENT Q65

RECIRCULATION LINE FLOW (L/HR)

FLOW vs. FVCO-OS-WALL CI POSITION



TOTAL PUMP FLOW (L/HR)



Answer Key and Question Data

Question # 65 (RO)	
Choice	Basis or Justification
a.	Incorrect, lowering RFP speed to 2800 will still be operating on the unsafe side of the min flow requirements curve.
b.	Incorrect, raising the FV-C-06-106B to 43% will move the operating point to the safe side of the min flow requirements curve, but is outside of the Optimum efficiency region
c.	Incorrect, lowering RFP speed to 2500 will move the operating point to the safe side of the min flow requirements curve, but is outside of the Optimum efficiency region
d.	Correct

Required Attachments or Reference	S06.1.C. Attachment 1 and Attachment 2
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	S06.1.C, S06.1.C
Learning Objective:	LLOT540.5e
Knowledge/Ability:	2.1.25
	Importance: RO 2.8 / SRO 3.1
(Description of K&A, from catalog) Ability to obtain and interpret station reference material such as graphs, monographs, and tables which contain performance data.	

Prepared by: CBG

Question: 66

WHICH ONE of the following describes basis for maintaining HPCI speed greater than 2200 rpm for prolonged operations?

- a. Ensure sufficient lube oil cooling
- b. Prevent exhaust line oscillations
- c. Prevent exceeding suction vortex limits
- d. Ensure NPSH limits are maintained

Question # 66 (RO)	
Choice	Basis or Justification
a.	Incorrect, this is the base for RCIC low RPM Limit
b.	Correct
c.	Incorrect, not affected by HPCI low RPM only affected by low suction source water level
d.	Incorrect, not affected by HPCI low RPM only affected by low suction source water level

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation		
Source:	New Exam Item	
Reference(s):	S55.7.A	
Learning Objective:	LLOT0340.4	
Knowledge/Ability:	2.1.32	Importance: RO 3.4 / SRO 3.8
(Description of K&A, from catalog)		
Ability to explain and apply system limits and precautions.		

Prepared by: CBG

Question: 67

WHICH ONE of the following describes the Unit 1 and Unit 2 injection points for the alternate injection subsystems listed?

	<u>Unit 1</u>	<u>Unit 2</u>
a.	RHRSW via "A" Loop RHR	RHRSW via "A" Loop RHR
b.	RHRSW via "B" Loop RHR	RHRSW via "B" Loop RHR
c.	Fire Water via "A" Loop RHR	Fire Water via "B" Loop RHR
d.	Fire Water via "B" Loop RHR	Fire Water via "A" Loop RHR

Answer Key and Question Data

Question # 67 (RO)	
Choice	Basis or Justification
a.b.c	Incorrect. Plausible distractors based on unit differences. Unit 1 injection with B loop, Unit 2 with A loop
d.	Correct.

Required Attachment or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	T-243, T-245
Learning Objective:	LLOT1870.01
Knowledge/Ability:	2.2.3
	Importance: 3.1/ 3.3
(Description of K&A, from catalog)	
Knowledge of the design, procedural, and operational differences between units	

Prepared by: JMS

Question: 68

Attachment Q68 is provided

Unit 1 plant conditions are as follows:

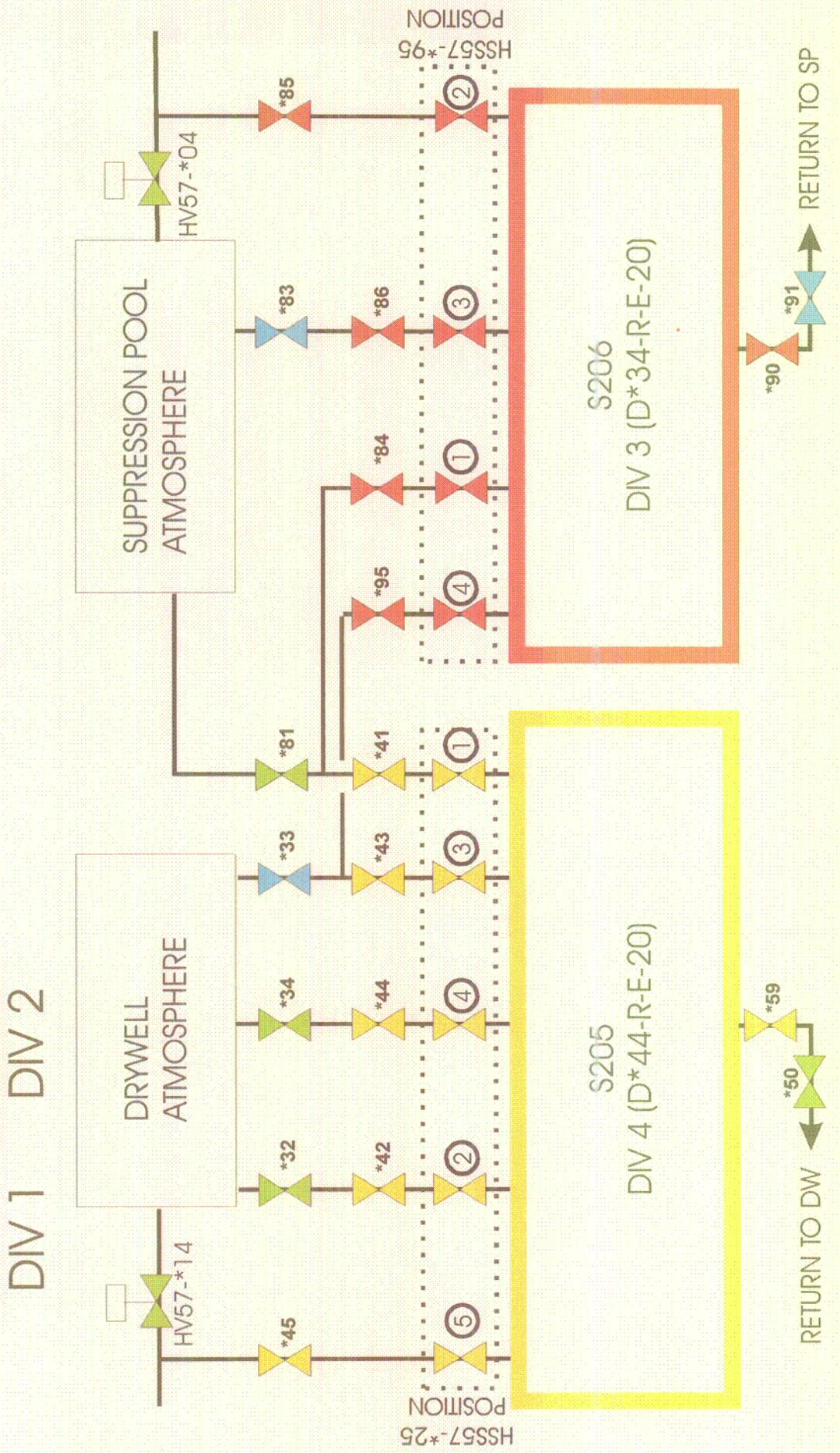
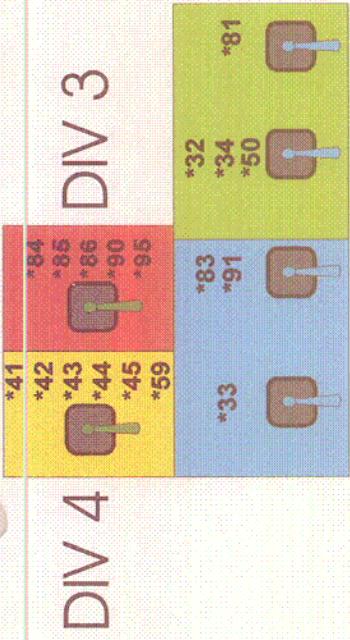
- OPCON 1
- Both Containment H₂O₂ Analyzers are in STANDBY

Maintenance activities have resulted in the planned closure of the Division 1 sample isolation valves.

WHICH ONE of the following describes whether Tech Spec Limiting Condition for Operation (LCO) ACTION entry is required and the reason based on the above conditions?

- a. No ACTION entry required because both analyzers can be aligned to sample the drywell and suppression pool
- b. No ACTION entry required because one analyzer can still be aligned to sample the drywell and suppression pool
- c. LCO ACTION required because one analyzer CANNOT sample the drywell
- d. LCO ACTION required because both analyzers CANNOT sample the drywell

H₂O₂ ANALYZER PATHS



Answer Key and Question Date

Question # 68 (RO)

Choice	Basis or Justification
a-b-d	Incorrect. Plausibility because one channel is operable, so drywell and pool can be sampled by one channel (S205).
c	Correct. The OP-AID shows the S206 analyzer as inoperable. The LCO requires two channels of H2 and O2 for drywell .

Required Attachment or Reference	H2O2 Analyzer MCR OP-AID with excess information deleted
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	LCO 3.3.7.5 (Accident Monitoring)	
Learning Objective:	LLOT0160.10	
Knowledge/Ability:	2.2.24	Importance: 2.6 / 3.8
(Description of K&A, from catalog) Ability to analyze the effect of maintenance activities on LCO status		

Prepared by: JMS

Question: 69

WHICH ONE of the following is the LGS accumulated annual dose where the first dose extension is required to be obtained for additional exposure, and the amount of additional dose authorized by the extension per HP-C-106, DOSIMETRY PROGRAM?

	<u>Dose at First Extension</u>	<u>Amount of Extension</u>
a.	2000 mRem	1000 mRem
b.	2000 mRem	500 mRem
c.	2500 mRem	1000 mRem
d.	2500 mRem	500 mRem

Answer Key and Question Data

Question # 69 (RO)	
Choice	Basis or Justification
a-c-d	Incorrect. Plausible because additional extensions are available at 2500, 3000, and 3500
b.	Correct

Required Attachment or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation		
Source:	New Exam Item	
Reference(s):	HP-C-106	
Learning Objective:	LLOT1760.06	
Knowledge/Ability:	2.3.4	Importance: 2.5/3.1
(Description of K&A, from catalog) Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized		

Prepared by: JMS

Question: 70

Unit 1 plant conditions are as follows:

- Drywell venting to REECE is in progress for pressure control per OT-101, HIGH DRYWELL PRESSURE

During the venting operation, a steam leak in the drywell is indicated on the containment leak detectors and the SOUTH STACK HI HI RAD alarm is received

WHICH ONE of the following describes the plant response and required actions, if any, based on the above conditions?

- a. Automatic Group 6B isolation will terminate the release. Ensure isolation of 2 inch vents and start of SGTS
- b. Automatic Group 6B isolation will terminate the release and SGTS will remain in standby. Ensure isolation of 2 inch vents.
- c. Alarm only. Manually isolate 2 inch vents and ensure at least one SGTS fan and filter is running in AUTO until normal release rates restored
- d. Alarm only. Manually isolate 2 inch vents and ensure drywell cooling is maximized

Answer Key and Question Data

Question # 70 (RO)

Choice	Basis or Justification
a.b.c	Incorrect. Manual action is required to terminate releases to the south stack and SGTS will not auto start on signal from south stack
D	Correct per OT-101, HIGH DRYWELL PRESSURE

Required Attachment or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-101, HIGH DRYWELL PRESSURE
Learning Objective:	LLOT1540.02
Knowledge/Ability:	2.3.11
	Importance: 2.7/3.2
(Description of K&A, from catalog) Ability to control radiation releases	

Prepared by: JMS

Question: 71

Unit 2 plant conditions are as follows:

- A reactor scram condition exists
- 24 control rods are at position 02
- All other control rods are fully inserted
- RPV level is +25 inches and stable
- Reactor power is on Range 2 of the IRMs

WHICH ONE of the following describes the status of the reactor based on the above conditions?

	<u>ATWS in progress</u>	<u>Reactor SHUTDOWN</u>
a.	YES	YES
b.	YES	NO
c.	NO	YES
d.	NO	NO

Answer Key and Question Data

Question # 71 (RO)	
Choice	Basis or Justification
a.	Incorrect
b.	Incorrect
c.	Correct – all rods to or beyond 02, therefore, no ATWS. Below range 6 of the IRMs is the definition of reactor “SHUTDOWN”.
d.	Incorrect

Required Attachment or Reference	None
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	TRIP Notes	
Learning Objective:	LLOT1560.05	
Knowledge/Ability:	2.4.17	Importance: RO 3.1 / SRO 3.8
(Description of K&A, from catalog) Knowledge of EOP terms and definitions		

Prepared by: caf

Question: 72

Unit 1 plant conditions are as follows:

- An ATWS is in progress with reactor power at 28%
- RPV pressure is 990 psig and stable
- RPV level is -40 inches and being lowered
- "1A" and "1B" RHR loops are in Suppression Pool cooling
- T-270, TERMINATE AND PREVENT INJECTION INTO THE RPV, has been completed in the Aux Equipment Room

RPV level reaches -135 inches

WHICH ONE of the following describes the operation of Core Spray and RHR Pumps based on the above conditions?

	<u>All Core Spray Pumps</u>	<u>"C" and "D" RHR Pumps</u>
a.	Will auto start	Will auto start
b.	Will auto start	May be manually started only
c.	May be manually started only	Will auto start
d.	May be manually started only	May be manually started only

Answer Key and Question Data

Question # 72 (RO)	
Choice	Basis or Justification
a., c., b.	Incorrect, the completion of T-270 in the AER prevents RHR and Core Spray Pumps from automatically starting on a LOCA (-129) signal. If RHR is currently running, it will remain running.
d.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation	
Source:	New Exam Item
Reference(s):	T-270
Learning Objective:	LLOT-1561.1
Knowledge/Ability:	2.4.48
	Importance: RO 3.5 / SRO 3.8
(Description of K&A, from catalog)	
Ability to interpret control room indications to verify the status and operation of systems and understand how operator actions and directives affect plant and system conditions	

Prepared by: CBG

Question: 73

Unit 1 is at 100% reactor power when the following events occur:

- Annunciator 107 G-2 REACTOR HI PRESSURE has alarmed
- RPV pressure is 1060 psig and stable on both Wide Range and Narrow Range Pressure Indicators

WHICH ONE of the following actions must be completed to reduce reactor pressure less than 1053 psig based on the above conditions?

- a. Slowly lower EHC Load Set
- b. Slowly increase EHC Max Combined flow
- c. Reduce reactor power
- d. Open "1K" SRV

Answer Key and Question Data

Question # 73 (RO)	
Choice	Basis or Justification
a.,b.,d.	Incorrect, OT-102 immediate actions require power reduction to reduce power to reduce reactor pressure
c.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-102
Learning Objective:	LLOT1540.2
Knowledge/Ability:	2.4.49
	Importance: RO 4.0 / SRO 4.0
(Description of K&A, from catalog) Ability to perform without reference to procedures those actions that require immediate operation of system components and controls	

Prepared by: CBG

Question: 74

Unit 2 plant conditions are as follows:

- Reactor SCRAM from 75% power due to main transformer fault
- RPV pressure is 985 psig and rising
- No EHC controls have been manipulated since the SCRAM
- EHC Pressure Set is 960 psig

The PRO notes that all Main Turbine Bypass Valves (BPVs) are closed and turbine speed is 1400 rpm and dropping

WHICH ONE of the following describes EHC status and the reason based on the above conditions?

- a. All BPVs should be closed because RPV pressure is below 990 psig.
- b. All BPVs should be closed because speed is less than 1600 rpm
- c. Some BPVs should already be open because PAM pressure exceeds pressure set
- d. Some BPVs should already be open because load set is gradually running back

Answer Key and Question Data

Question # 74 (RO)	
Choice	Basis or Justification
a.	Incorrect. They should be almost fully open by now. Distractor 990 is the full-open pressure
b.	Incorrect. They should be almost fully open by now.
c.	Correct. The RO monitoring EHC should conclude by now that the BPVs are malfunctioning. They should have begun opening at 960 psig and will be fully open at 990
d.	Incorrect. Load set drops to zero immediately after the trip

Required Attachment or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	EHC Logic Op-Aid	
Learning Objective:	LLOT0590.02	
Knowledge/Ability:	295005AA1.05	Importance: 3.6/3.6
(Description of K&A, from catalog) Ability to monitor and/or operate Reactor/Turbine Pressure Regulating System as it applies to Main Turbine Generator Trip		

Prepared by: JMS

Question: 75

Unit 1 plant conditions are as follows:

- A LOCA is in progress
- RPV level is -120 inches and lowering
- Drywell pressure is 14 psig and rising
- RPV pressure is 470 psig and lowering

RPV pressure drops to 438 psig and the following actions occur:

- Immediate Operator Actions per SE-10, LOCA were performed
- All shunt trips have been reset
- No other operator actions have been performed

WHICH ONE of the following components will continue to be cooled based on the above conditions?

- a. Reactor Recirc Pump Motor Air Coolers
- b. Reactor Recirc Pump Motor Oil Coolers
- c. Condensate Pump Bearing Oil Coolers
- d. Instrument Gas Compressors

Answer Key and Question Data

Question # 75 (RO)

Choice	Basis or Justification
a.	Incorrect, Reactor Recirc Pump Motor air coolers are cooled by Drywell Chilled Water which will isolate and must be manually restored
b.	Incorrect, Reactor Recirc Pump Motor Oil coolers are cooled by RECW. RECW Pumps will trip on a LOCA signal and must be manually restarted
c.	Correct, condensate pumps are cooled by TECW which will automatically restart after a LOCA signal
d.	Incorrect, Instrument Gas compressors are cooled by RECW. RECW Pumps will trip on a LOCA signal and must be manually restarted

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		

Source Documentation		
Source:	New Exam Item	
Reference(s):	ON-113	
Learning Objective:	LLOT0640.7A	
Knowledge/Ability:	295018AA2.01	Importance: RO 3.3 / SRO 3.4
(Description of K&A, from catalog) Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of CCW: Component Temperatures		

Prepared by: CBG

Question: 51

Attachment Q51 is provided

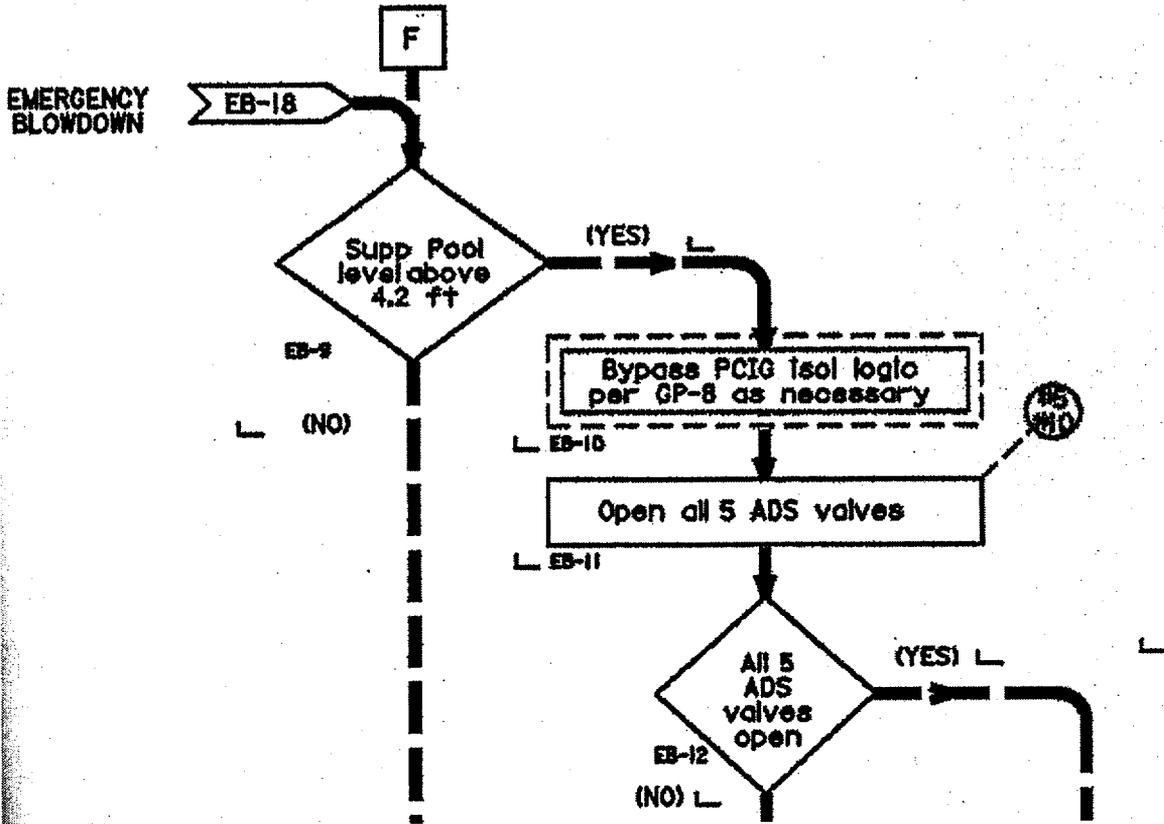
Unit 2 plant conditions are as follows:

- An emergency RPV blowdown is required
- Drywell pressure is 20 psig
- All control rods are inserted
- PCIG receiver pressure is 50 psig

WHICH ONE of the following describes the required actions and the resulting source of pneumatics for ADS valves based on the above conditions?

- a. Place ADS valve switches immediately to OPEN. ADS valves will open using accumulator pressure and N2 from bottles through Group 7C (PCIG to ADS Lines).
- b. Place ADS valve switches immediately to OPEN. ADS valves will open using accumulator pressure and N2 from PCIG receivers through Group 7A (PCIG Process Lines).
- c. Bypass PCIG isolations and open Group 7A (PCIG Process Lines) isolation valves, then place ADS valve switches to OPEN. ADS valves will open using N2 from bottles through Group 7A lines.
- d. Bypass PCIG isolations and open Group 7C (PCIG to ADS Lines) isolation valves, then place ADS valve switches to OPEN. ADS valves will open using N2 from PCIG receivers through Group 7C lines.

ATTACHMENT Q51



Answer Key and Question Data

Question # 51 (SRO)

Choice	Basis or Justification
a.	Correct. ADS supply is available and the valves will open without bypassing isolations. T-112 specifies "as necessary." The question examines the ability to direct the correct actions based in NS4 knowledge.
b.	Incorrect. Group 7A is isolated on drywell pressure
c.	Incorrect. Bypass is unwarranted, and the flow path incorrectly indicates ADS will function on bottle pressure through 7A valves. Bottles can only go through 7C valves
d.	Incorrect. Bypass is unwarranted, and 7C valves are still open (isolation signal is 2 psid compared to drywell). Receiver pressure will not align to ADS valves because swap over to bottles occurred at 80 psig.

Required Attachments or Reference	Attachment Q51 – Portion of T-112
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	T-112, GP-8		
Learning Objective:	LLOT1560.06		
Knowledge/Ability:	223002 2.4.6	SRO Importance:	4.0
(Description of K&A, from catalog)			
Knowledge of symptom based EOP mitigation strategies as it relates to PCIS/Nuclear Steam Supply Shutoff System			

Prepared by: JMS

Question: 52

Unit 2 plant conditions are as follows:

- The 101 Safeguards Transformer is out of service
- The 201 Safeguards Transformer is supplying all 4KV buses

Diesel Generator D24 has failed to manually start due to a loss of the starting air system

WHICH ONE of the following describes the actions required to continue operation in OPCON 1 for at least the next 20 days based on the above conditions?

- a. Restore D24 to operable within 8 hours
- b. Restore D24 to operable within 24 hours
- c. Restore the 101 Safeguard source to operable within 72 hours
- d. Restore the 101 Safeguard source to operable within 7 days

Answer Key and Question Data

Question # 52 (SRO)	
Choice	Basis or Justification
a-b-d	Incorrect, D24 is required to be restored in 72 hours because it does supply a two train system (CE Chillers). TS 3.8.1.1.d requires that the offsite source be restored within 72 hours. If D24 is inop. with one offsite source operable, the Unit will be in a 30 shutdown LCO.
c.	Correct per the LCO

Required Attachments or Reference	Tech Spec 3.8.1.1.d
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.1

Source Documentation	
Source:	Modified Bank Item
Reference(s):	Tech Spec 3.8.1.1.d
Learning Objective:	LLOT1800.5B
Knowledge/Ability:	262001G.2.2.22 Importance: RO 3.4 / SRO 4.1
(Description of K&A, from catalog)	
Knowledge of limiting conditions for operation and safety limits	

Prepared by: CBG

Question: 53

Unit 1 plant conditions are as follows:

- OPCON 2 during plant startup
- RPV pressure is 175 psig
- Heatup in progress

Fire Protection Group reports that one of the three fire suppression heat sensors in the RCIC room are inoperable.

WHICH ONE of the following describes the required actions, if any, based on the above conditions?

- a. Establish an hourly fire watch within the next hour
- b. No actions required provided the other two heat detectors and both smoke detectors are operable
- c. No action provided RPV pressure is stabilized below 200 psig
- d. Restore the instrument to operable within 14 days or establish a continuous fire watch within the next hour

Answer Key and Question Data

Question # 53 (SRO)

Choice	Basis or Justification
a.	Correct per TRM 3.3.7.9
b-c-d	Incorrect. Plausible due to design of the TRM and common misconception about x/y detectors

Required Attachments or Reference	TRM 3.3.7.9
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.1

Source Documentation			
Source:	New Exam Item		
Reference(s):	TRM 3.3.7.9, S22.8.H		
Learning Objective:	LLOT0733.09		
Knowledge/Ability:	286000 2.4.25	SRO Importance: 3.4	
(Description of K&A, from catalog)			
Knowledge of fire protection procedures			

Prepared by: JMS

Question: 54

Unit 2 plant conditions are as follows:

- 100% power indicated on APRMs
- Half of a 12 hour shift has expired
- Reactor Engineering has corrected an error in the reactor heat balance calculation in the process computer that was causing calculated power to exceed actual power by 30 MWth
- CTP actual on process computer is now 3425 MWth
- CTP shift average on process computer now indicates 3410 MWth

WHICH ONE of the following describes the maximum shift average power now attainable and the required action for achieving the average per GP-5, POWER OPERATION based on the above conditions?

	<u>Maximum Shift Average Attainable (MWth)</u>	<u>Maintain Power for Rest of Shift at (MWth):</u>
a.	3458	3491
b.	3458	3505
c.	3434	3425
d.	3434	3458

Answer Key and Question Data

Question # 54 (SRO)

Choice	Basis or Justification
a.	Incorrect. Exceeds license power level and calc based on instantaneous power vs average
b.	Incorrect. Mathematically the correct target for hitting 3458 average but exceeds license power limit
c.	Incorrect. Based on maintaining constant power but the stem requires maximized shift average
d.	Correct. The condition in the license is that power may not be intentionally raised above 100% (3458). Shift average will be 3434 at the end of this shift if 3458 is maintained.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.1

Source Documentation			
Source:	New Exam Item		
Reference(s):	GP-5, "POWER OPERATION", Tech SPecs		
Learning Objective:	LLOT1530.05		
Knowledge/Ability:	2.1.10	SRO Importance:	3.9
(Description of K&A, from catalog)			
Knowledge of conditions and limitations in the facility license			

Prepared by: JMS

Question: 55

Unit 1 plant conditions are as follows:

- OPCON 4
- "1A" RHR is in Shutdown Cooling
- Reactor Coolant Temperature is 161°F

"1A" RHR pump trips and results in Reactor Coolant Temperature rising at 40°F per hour.

WHICH ONE of the following describes the OPCON and required action one hour later based on the above conditions?

	<u>OPCON</u>	<u>ACTION</u>
a.	3	Secure Operations with the potential to drain the vessel
b.	3	Establish secondary containment
c.	4	Secure Operations with the potential to drain the vessel
d.	4	Establish secondary containment

Answer Key and Question Data

Question # 55 (SRO)

Choice	Basis or Justification
a.c.d.	Incorrect, RPV coolant temperature rising above 200 degrees is entry into OPCON 3, once OPCON 3 is entered; Secondary containment integrity is required per Tech Spec. 3.6.5.1.1
b.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.1

Source Documentation			
Source:	New Exam Item		
Reference(s):	GP-6.2 / GP-3.1		
Learning Objective:	LLOT1800.3.B		
Knowledge/Ability:	2.1.22	Importance:	RO 2.8/ SRO 3.3
(Description of K&A, from catalog)			
Ability to determine Mode of Operation			

Prepared by: CBG

Question: 56

Attachment T-116 is provided

Unit 1 plant conditions are as follows:

- Reactor SCRAM 3 hours ago
- RPV water level is unknown
- The RPV remained flooded for 100 minutes per T-116, RPV FLOODING
- RPV reference legs have been filled
- Injection was terminated five minutes ago to regain level indication

All level indicators have remained upscale for the past five minutes.

WHICH ONE of the following describes the required actions based on the above conditions and the reason?

	<u>Required Action</u>	<u>Reason</u>
a.	Re-flood the vessel for 90 minutes	RPV level is assumed to be at the top of active fuel
b.	Re-flood the vessel for 90 minutes	Clad temperature is assumed to be excessive
c.	Enter RC/L and RC/P leg of T-101, RPV CONTROL	RPV level is assumed to be at the top of active fuel
d.	Enter RC/L and RC/P leg of T-101, RPV CONTROL	Clad temperature is assumed to be excessive

BACK OF EXAM
FOR INIP
FLOODING

Answer Key and Question Data

Question # 56 (SRO)

Choice	Basis or Justification
a-c-d	Incorrect. T-116 requires repeat of the flooding evolution due to excessive clad temp. Plausible distractors based on common misconceptions.
b.	Correct per T-116. The Maximum Core Uncovery Time Limit is between 4 and 5 minutes, and defines the point where a core devoid of water will reach 1500 °F clad temp.

Required Attachments or Reference	T-116 RPV Flooding Flowchart
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	T-116		
Learning Objective:	LLOT1560.06		
Knowledge/Ability:	2.1.32	SRO Importance: 3.8	
(Description of K&A, from catalog)			
Ability to apply and explain system limits and precautions			

Prepared by: JMS

Maximum Core Uncovery Time Limit (MCUTL), defined to be the greatest amount of time that the clad temperature of the hottest fuel rod will not exceed 1500°F with the core completely uncovered and uncooled. The MCUTL is a function of the time after reactor shutdown, and is utilized to preclude fuel damage during recovery from the RPV flooding evolution (Remove after review)

Question: 57

Unit 2 plant conditions are as follows:

- The Equipment Operator (EO) is placing "2B" CRD Pump in service using a newly approved revision of S46.1.A, CONTROL ROD DRIVE HYDRAULIC SYSTEM STARTUP
- The EO reports that the procedure cannot be performed as written and points out the procedure directs the wrong min flow valve to be operated for the "B" pump as follows:

	<u>2A PUMP ONLY</u>
4.16	Slowly THROTTLE 046-2014A, "A CRD Pump Min-Flow Stop Valve," approximately 5 - 5 3/4 turns in close direction from full open position.
	<u>2B PUMP ONLY</u>
4.17	Slowly THROTTLE 046-2014A, "A CRD Pump Min-Flow Stop Valve," approximately 5 1/4 - 5 1/2 turns in close direction from full open position.

WHICH ONE of the following describes the actions for addressing the error based on the above conditions?

- a. Direct the EO to operate 046-2014B, then initiate a Procedure Problem Identification System issue (PPIS)
- b. Direct the EO to operate 046-2014B, then process a Temporary Change (TC)
- c. Initiate a Procedure Problem Identification System issue (PPIS), then direct the EO to operate 046-2014B
- d. Process a Temporary Change (TC), then direct the EO to operate 046-2014B

Answer Key and Question Data

Question # 57 (SRO)

Choice	Basis or Justification
a.	Incorrect. The procedure must be addressed before proceeding per HU-AA-104
b.	Incorrect. The procedure must be addressed before proceeding per HU-AA-104
c.	Incorrect Not a PPIS since the scope is beyond minor typos and the error does impact successful completion of the procedure in that it cannot be performed as written. <i>Minor grammar, format, or typographical errors which do not impact successful performance of the procedure should be dispositioned using a PPIS per AG-CG-87.</i>
d.	Correct per A-3. <i>Errors in equipment numbers, equipment condition (on/off, open/closed), numerical values, and sample calculations shall be considered TC's</i>

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO
			10CFR55.43.b.3

Source Documentation			
Source:	New Exam Item		
Reference(s):	A-3		
Learning Objective:	LLOT1570.01		
Knowledge/Ability:	2.2.11	Importance:	2.5/3.4
(Description of K&A, from catalog) Knowledge of the process for controlling temporary changes			

Prepared by: JMS

Question: 58

Unit 1 plant conditions are as follows:

- Troubleshooting on the "1B" Instrument Gas Receiver Drain Trap DT-59-127B is complete. Nitrogen was discovered to be constantly blowing through the trap.
- The clearance has been removed

The system is being returned to service with the trap manually isolated by closing the trap inlet valve 59-1054B. The crew was to manually blow out moisture hourly by cracking open the trap bypass valve 59-1053B.

WHICH ONE of the following is the method for documenting the position of 59-1053B and 59-1054B per OP-AA-108-106, EQUIPMENT RETURN TO SERVICE based on the above conditions?

- a. Danger Tag
- b. Information Tag
- c. Equipment Status Tag
- d. Equipment Trouble Tag

Answer Key and Question Data

Question # 58 (SRO)

Choice	Basis or Justification
a.	Incorrect. Cannot operate hourly with Danger Tag
b.	Incorrect. Part of the clearance which has been removed
c.	Correct. Used for documenting abnormal position
d.	Incorrect. For documenting broken equipment (for example, the trap itself would have had an ETT applied which initiated the work order for the original troubleshooting)

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO
			10CFR55.43.b.5

Source Documentation		
Source:	Modified from 2002 LGS/PBAPS LSRO exam.	
Reference(s):	OP-AA-108-106	
Learning Objective:	LLOT1574.17	
Knowledge/Ability:	2.2.20	SRO Importance: 3.3
(Description of K&A, from catalog) Knowledge of the process for controlling troubleshooting activities		

Prepared by: JMS

Question: 59

Unit 1 plant conditions are as follows:

- OPCON 5 with core verification in progress
- Spent fuel bundles are being moved in the fuel pool for re-racking
- RIS-33-1M-1K600, Pool Plug Laydown ARM is INOP

During re-rack the RIS-30-1M-1K600, Steam Separator Area ARM fails and must be taken out of OPERATE.

WHICH ONE of the following describes the ability to continue with re-racking based on the above conditions?

- a. Must be secured until a portable monitor is set up or either inoperable channel is restored
- b. May continue provided area surveys are performed in the vicinity of the spent fuel pool once per 24 hours
- c. May continue provided core verification results in no need for in-core fuel movement
- d. May continue provided RIS-31-1M-1K600 Spent Fuel Pool ARM is operable

Answer Key and Question Data

Question # 59 (SRO)

Choice	Basis or Justification
a.	Correct. Per LGS LCO 3.3.7.1 and FH-106
b-c-d	Incorrect. Fuel movements must be secured regardless of the status of the other monitors, surveys, or core alterations

Required Attachments or Reference	Tech Specs
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.7

Source Documentation		
Source:	New Exam Item	
Reference(s):	LCO 3.3.7.1, FH-106	
Learning Objective:	LLOT1800.05	
Knowledge/Ability:	2.2.26	SRO Importance: 3.7
(Description of K&A, from catalog)		
Knowledge of refueling administrative requirements		

Prepared by: JMS

Question: 60

Valve packing replacement is being planned in the "2A" RWCU Pump Room. HP has provided the following information:

- Work area dose rate is 300 mR/hr
- It will take one worker 15 minutes to install shielding in the work area
- Shielding installation will reduce work area dose rate to 30 mR/hr
- One worker can complete the packing replacement in 15 minutes
- Two workers can complete the packing replacement in 10 minutes

WHICH ONE of the following will result in the lowest possible total exposure to complete the valve packing replacement based on the above conditions?

	<u>Shielding</u>	<u>Workers Used</u>
a.	Used	One
b.	Not Used	One
c.	Used	Two
d.	Not Used	Two

Answer Key and Question Data

Question # 60 (SRO)

Choice	Basis or Justification
a.	Incorrect, two workers shielded 82.5 mR
b.	Correct, one worker unshielded 75 mR
c.	Incorrect, two workers shielded 85 mR
d.	Incorrect, two workers unshielded 100 mR

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.4

Source Documentation			
Source:	New Exam Item		
Reference(s):	RP-AA-400		
Learning Objective:	LLOT1760.7		
Knowledge/Ability:	2.3.2	Importance:	RO / SRO 2.9
(Description of K&A, from catalog) Knowledge of the facility ALARA program			

Prepared by: CBG

Question: 61

An Equipment Operator has been assigned to enter the Condenser Bay to investigate a steam leak. The following information has been provided.

- Equipment Operator has 3280 TEDE annual Exposure
- Expected dose for investigation of the steam leak is 300 mR

WHICH ONE of the following describes required action needed to complete the steam leak investigation, if any based on the above conditions?

- a. Dose Control Level Extension must be obtained
- b. Emergency Exposure Extension must be obtained
- c. Planned Special Exposure must be obtained
- d. No action required if total exposure is less than 4000mR

Question # 61 (SRO)

Choice	Basis or Justification
a.	Correct per RP-AA-203
b-c-d.	<p>Incorrect, RP-AA-203 requires dose extension above 2000 mR TEDE. Dose extensions are granted in 500 mR increments. The current extension is good to 3500 mR. Another extension is required to get to 3580 mR expected exposure.</p> <p>This evolution dose not qualify as a Planned Special Exposure or Emergency Exposure Extension.</p>

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO
			10CFR55.43.b.4

Source Documentation		
Source:	New Exam Item	
Reference(s):	RP-AA-203	
Learning Objective:	LLOT1760.6	
Knowledge/Ability:	2.3.4	Importance: RO / SRO 3.1
(Description of K&A, from catalog)		
Knowledge of radiation exposure limits and contamination controls, including permissible levels in excess of those specified		

Prepared by: CBG

Question: 62

Attachment T-103, T-104, and ERP-101 are provided

Unit 2 is at 85% power when the following events occur:

- HPCI inadvertent start occurs with a failure of manual isolation
- Main Steam Line Radiation rises to 2 times the normal level and stabilizes
- HPCI Room Radiation rises to 3 Rem and stabilizes
- No pipe breaks exist
- North Stack Noble Gas has been stable at 205 times the HI HI limit for 18 minutes
- Dose Projections will not available be available for 30 minutes

WHICH ONE of the following describes action that must be taken and the procedure that directs the action based on the above conditions?

- a. Perform a GP-3 Shutdown as directed by T-103, SECONDARY CONTAINMENT CONTROL
- b. Transfer house loads, Runback Recirc to minimum, SCRAM at 50% Core Flow per T-103, SECONDARY CONTAINMENT CONTROL
- c. Perform an T-112 Emergency Blowdown as directed by T-104, RADIOACTIVITY RELEASE CONTROL
- d. Reduce power to maintain Main Steam Line Rad < 1.5 times normal per ON-102, AIR EJECTOR DISCHARGE OR MAIN STEAM LINE HIGH RADIATION

Fission Product Barrier Table

3.1 Initiating Condition Matrix

CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	3.1.1 Applicable Opcons: 1, 2, 3 ANY Loss <u>OR</u> ANY Potential Loss of Primary Containment
ALERT	3.1.2 Applicable Opcons: 1, 2, 3 ANY Loss <u>OR</u> ANY Potential Loss of EITHER Fuel Clad <u>OR</u> RCS
SITE AREA EMERGENCY	3.1.3 Applicable Opcons: 1, 2, 3 Loss of BOTH Fuel Clad <u>AND</u> RCS <u>OR</u> Potential Loss of BOTH Fuel Clad <u>AND</u> RCS <u>OR</u> Potential Loss of EITHER Fuel Clad <u>OR</u> RCS, <u>AND</u> Loss of ANY Additional Barrier
GENERAL EMERGENCY	3.1.4 Applicable Opcons: 1, 2, 3 Loss of ANY Two Barriers <u>AND</u> Potential Loss of Third Barrier ***PAR*** Evacuate 2 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 2-5 miles. (See Fission Product Barrier Table 3.2 for exception based on extremely Hi Containment Radiation Levels.)

NOTES:

1. If a "Loss" condition is satisfied, the "Potential Loss" category can be considered satisfied. This is accounted for in the matrix contained in the Fission Product Barrier Table 3.2 used to determine the proper classification based on Fission Product Barrier status.
2. For all conditions listed in Fission Product Barrier Table 3.2, the barrier failure column is only satisfied if it fails when called upon to mitigate an accident. For example, failure of both containment isolation valves to isolate with a downstream pathway to the environment is only a concern during an accident. If this condition exists during normal power operations, it will be an active Technical Specification Action Statement. However, during accident conditions, this will represent a breach of containment.

3.2 Fission Product Barrier Status Table

Barrier Parameter	Fuel Clad		Reactor Coolant System		Primary Containment	
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
Reactor Coolant Activity	Reactor Coolant activity > 300 $\mu\text{Ci/gm}$ Dose Equivalent Iodine 131	N/A	N/A	N/A	N/A	N/A
RPV Level	RPV level < -186 "	RPV level < -161 "	RPV level < -161 "	N/A	N/A	RPV level cannot be restored above -186 " within the time limit of the "SAFE" region of the Maximum Core Uncovery Time Limit Curve (T-116, RF-1)
RPV Level Unknown	N/A	N/A	N/A	RPV level cannot be determined	N/A	RPV level cannot be determined AND RPV Flooding cannot be established as indicated by inability to maintain 5 ADS/SRVs open with RPV pressure at least 50 psig above Suppression Pool pressure per T-116
RCS Leak Rate	N/A	N/A	N/A	RCS leakage > 50 gpm	N/A	N/A
Drywell Pressure	N/A	N/A	Drywell Pressure > 1.68 psig AND Indication of a leak inside drywell	N/A	Rapid, unexplained decrease in Drywell Pressure following initial increase OR Drywell pressure response not consistent with LOCA conditions	Drywell Pressure > 44 psig and increasing OR Drywell Hydrogen > 6% AND Drywell Oxygen > 5%
Drywell Radiation	Drywell Rad Monitor reading > 4×10^4 R/hr	N/A	Drywell Rad Monitor reading > 15 R/hr	N/A	N/A	Drywell Rad Monitor reading > 3×10^5 R/hr ***PAR*** Evacuate 5 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 5-10 miles.

5.0 Radioactivity Release

5.1 Effluent Release and Dose

CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	<p>IC Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Radiological Technical Specifications for 60 Minutes or Longer</p> <p>5.1.1.a Applicable Opcons: ALL</p> <p>A valid reading on one or more of the following radiation monitors that exceeds TWO TIMES the HiHi alarm setpoint value for > 60 minutes:</p> <p>North Stack, South Stack, Radwaste Discharge, Service Water, RHRSW <u>AND</u></p> <p>Calculated maximum offsite dose rate using computer dose model exceeds 0.114 mRem/hr TPARD OR 0.342 mRem/hr child thyroid CDE based on a 60 minute average</p> <p>Note: If the required dose projections cannot be completed within the 60 minute period, then the declaration must be made based on the valid sustained monitor reading.</p> <p>5.1.1.b Applicable Opcons: ALL</p> <p>Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates exceeding TWO TIMES Tech Specs (ODCM 3.2.2 and 3.2.3) for > 60 minutes</p>
ALERT	<p>IC Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times Radiological Technical Specifications for 15 Minutes or Longer</p> <p>5.1.2.a Applicable Opcons: ALL</p> <p>A valid reading on one or more of the following radiation monitors that exceeds TWO HUNDRED TIMES the HiHi alarm setpoint value for > 15 minutes:</p> <p>North Stack, South Stack, Radwaste Discharge, Service Water, RHRSW <u>AND</u></p> <p>Calculated maximum offsite dose rate exceeds 11.4 mRem/hr TPARD OR 34.2 mRem/hr child thyroid CDE based on a 15 minute average</p> <p>Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading.</p> <p>5.1.2.b Applicable Opcons: ALL</p> <p>Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates exceeding TWO HUNDRED TIMES Tech Specs (ODCM 3.2.2 and 3.2.3) for > 15 minutes</p>

<p>SITE AREA EMERGENCY</p>	<p>IC Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mR Whole Body or 500 mR Child Thyroid for the Actual or Projected Duration of the Release</p> <p>5.1.3 Applicable Opcons: ALL</p> <p>A valid reading on one or more of the following radiation monitors that exceeds or is expected to exceed the value shown for > 15 minutes <u>AND</u> Dose Projections are not available:</p> <p>North Stack 4.16E+6 μCi/second</p> <p>South Stack 2.25E-3 μCi/cc</p> <p>Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading.</p> <p><u>OR</u> Projected offsite dose using computer dose model exceeds 100 mRem TPARD <u>OR</u> 500 mRem child thyroid CDE</p> <p><u>OR</u> Analysis of Field Survey results indicate site boundary whole body dose rate exceeds 100 mRem/hr expected to continue for more than one hour, <u>OR</u> Analysis of Field Survey results indicate child thyroid dose commitment of 500 mRem for one hour of inhalation</p>
<p>GENERAL EMERGENCY</p>	<p>IC Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity that Exceeds 1000 mR Whole Body or 5000 mR Child Thyroid for the Actual or Projected Duration of the Release Using Actual Meteorology</p> <p>5.1.4 Applicable Opcons: ALL</p> <p>A valid reading on one or more of the following radiation monitors that exceeds or is expected to exceed the value shown for > 15 minutes <u>AND</u> Dose Projections are not available:</p> <p>North Stack 4.16E+7 μCi/second</p> <p>South Stack 2.25E-2 μCi/cc</p> <p>Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading.</p> <p><u>OR</u> Projected offsite dose using computer dose model exceeds 1000 mRem TPARD <u>OR</u> 5000 mRem child thyroid CDE</p> <p><u>OR</u> Analysis of Field Survey results indicate site boundary whole body dose rate exceeds 1000 mRem/hr expected to continue for more than one hour, <u>OR</u> Analysis of Field Survey results indicate child thyroid dose commitment of 5000 mRem for one hour of inhalation</p> <p style="text-align: center;">***PAR***</p> <p>Evacuate 2 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 2-5 miles.</p>

NOTE: CDE = Committed Dose Equivalent, TPARD = Total Protective Action Recommendation Dose

7.0 Internal Events

7.3 Loss of Assessment / Communication Capability

CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	<p>IC Unplanned Loss of Most or All Safety System Annunciation or Indication in The Control Room for Greater Than 15 Minutes</p> <p>7.3.1.a Applicable Opcons: 1, 2, 3</p> <p>Unplanned loss of most or all safety system annunciators (Table 7-1) <u>OR</u> indicators (Table 7-2) for > 15 minutes requiring increased surveillance to safely operate the unit(s).</p> <p>IC Unplanned Loss of All Onsite or Offsite Communications Capabilities</p> <p>7.3.1.b Applicable Opcons: ALL</p> <p>Loss of ALL Onsite communications (Table 7-3) affecting the ability to perform routine operations <u>OR</u> Loss of ALL Offsite communications (Table 7-3)</p>
ALERT	<p>IC Unplanned Loss of Most or All Safety System Annunciation or Indication In Control Room With Either (1) a Significant Transient in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable</p> <p>7.3.2 Applicable Opcons: 1, 2, 3</p> <p>Unplanned loss of most or all safety system annunciators (Table 7-1) <u>OR</u> indicators (Table 7-2) for > 15 minutes requiring increased surveillance to safely operate the unit(s) <u>AND EITHER</u> A significant plant transient is in progress (Table 7-4) <u>OR</u> the plant monitoring system (PMS) is unavailable.</p>
SITE AREA EMERGENCY	<p>IC Inability to Monitor a Significant Transient in Progress</p> <p>7.3.3 Applicable Opcons: 1, 2, 3</p> <p>Loss of safety system annunciators (Table 7-1) <u>AND</u> indicators (Table 7-2) <u>AND</u> PMS <u>AND</u> a significant plant transient is in progress. (Table 7-4)</p>
GENERAL EMERGENCY	None

Table 7-1 Safety System Annunciators

CCS

Containment Isolation
Reactor Trip
Process Radiation Monitoring

Table 7-2 Safety Function Indicators

Reactor Power
Decay Heat Removal
Containment Safety Functions

Table 7-3 Communications

	Onsite	Offsite
Site Phones (Dimension 2000)	X	X
PRELUDE System	X	X
Plant Public Address	X	
Station Radio	X	
NRC (FTS-2000)		X
PA State Police Radio		X
County Police Radio		X
Load Dispatcher Radio		X
PECO Dial Network		X

Table 7-4 Significant Plant Transients

SCRAM
Recirc Runbacks > 25% thermal power
Sustained power oscillations 25% peak to peak
Stuck open relief valve(s)
ECCS injection

8.0 External Events

8.1 Security Threats

CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	<p>IC Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant</p> <p>8.1.1 Applicable Opcons: ALL A credible threat to the station reported by the NRC. <u>OR</u> An actual threat that meets ALL of the following criteria:</p> <ul style="list-style-type: none"> • A credible threat reported by any other outside agency or determined per SY-AA-101-132; <u>AND</u> • Is specifically directed towards the station; <u>AND</u> • Is imminent (within 2 hours). <p><u>OR</u> Attempted intrusion and attack to the Protected Area <u>OR</u> Attempted sabotage discovered within the Protected Area <u>OR</u> Hostage/Extortion situation that threatens normal plant operations</p>
ALERT	<p>IC Security Event in a Plant Protected Area</p> <p>8.1.2 Applicable Opcons: ALL Intrusion into plant protected area by a hostile force <u>OR</u> Confirmed bomb, sabotage or sabotage device discovered in the Protected Area</p>
SITE AREA EMERGENCY	<p>IC Security Event in a Plant Vital Area</p> <p>8.1.3 Applicable Opcons: ALL Intrusion into plant Vital area by a hostile force <u>OR</u> Confirmed bomb, sabotage or sabotage device discovered in a Vital Area</p>
GENERAL EMERGENCY	<p>IC Security Event Resulting in Loss of Ability to Reach and Maintain Cold Shutdown</p> <p>8.1.4 Applicable Opcons: ALL Loss of physical control of the control room due to security event <u>OR</u> Loss of physical control of the remote shutdown capability due to security event ***PAR*** Evacuate 2 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 2-5 miles.</p>

Answer Key and Question Data

Question # 62 (SRO)	
Choice	Basis or Justification
a.	Incorrect, with no unisolable steam leak present and rad levels less than MSO in two areas the only required action is to reduce power per ON-102.
b.	
c.	
d.	Correct

Required Attachments or Reference	T-103, T-104, ERP-101 5.1 Effluent Release and Dose
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.4

Source Documentation			
Source:	New Exam Item		
Reference(s):	ERP-101, T-103, T-104		
Learning Objective:	LLOT1560.6		
Knowledge/Ability:	2.3.10	Importance:	RO / SRO 3.3
(Description of K&A, from catalog)			
Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure			

Prepared by: CBG

Question: 63

Unit 2 plant conditions are as follows:

- 100% Power
- PMS is inoperable

A loss of all Unit 2 annunciators occurred 17 minutes ago. While monitoring MCR panels the Plant Reactor Operator reports that a Low Speed Recirculation System Runback has just occurred.

WHICH ONE of the following describes the ERP classification that must be made based on the above conditions?

- a. Unusual Event
- b. Alert
- c. Site Area Emergency
- d. General Emergency

Answer Key and Question Data

Question # 63 (SRO)	
Choice	Basis or Justification
a-c-d.	Incorrect per ERP-101
b	Correct, ERP 101 provides the following information, Loss of most or all Safety System annunciation or indication in the MCO >15 minutes is an Unusual Event. The above combined with a Significant Transient or a loss of PMS is an Alert.

Required Attachments or Reference	ERP-101, 7.3 Loss of Assessment / Communication Capability
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	ERP-101, 7.3		
Learning Objective:			
Knowledge/Ability:	2.4.32	Importance:	RO / SRO 2.8
(Description of K&A, from catalog)			
Knowledge of operator responses to loss of all annunciators			

Prepared by: CBG

Question: 64

Unit 2 plant conditions are as follows:

- 100% Power
- I&C is performing ST-2-001-409-2, NSSSS – MAIN STM LINE PRESSURE – LOW CHANNEL A (LINE A) CALIBRATION / FUNCTIONAL TEST
- Annunciator 211 RECIRC D-5, NSSSS ISOL SYS OUT OF SERVICE has repeatedly alarmed due to the test
- The CRS has determined this alarm to be a nuisance and has authorized the annunciator mode switch to be placed in the “Manual” Mode
- The ST did not provide steps for changing the Annunciator Mode switch position

WHICH ONE of the following describes that action that must be taken based on the above conditions?

- a. An Equipment Status Tag (EST) must be used if the annunciator will be in manual greater than one hour
- b. An Equipment Status Tag (EST) must be used if the annunciator will be in manual greater than one shift
- c. An Equipment Trouble Tag (ETT) must be used if the annunciator will be in manual greater than one hour
- d. An Equipment Trouble Tag (ETT) must be used if the annunciator will be in manual greater than one shift

Answer Key and Question Data

Question # 64 (SRO)	
Choice	Basis or Justification
a.c.d.	Incorrect, OP-AA-103-102, Requires that a nuisance alarm which has been placed in the manual mode, requires an EST if the annunciator will not be return to its normal status during the shift. If the test has procedure direction for controlling the annunciator mode switch, an EST is not required.
b.	Correct
c.	
d.	

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO
			10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	OP-AA-103-102	
Learning Objective:		
Knowledge/Ability:	2.4.33	Importance: RO / SRO 2.8
(Description of K&A, from catalog)		
Knowledge of the process used to track inoperable alarms		

Prepared by: CBG

Question: 65

Attachment ERP-200-1 is provided

Unit 1 plant conditions are as follows:

- OPCON 1 on nightshift
- Unusual Event has been declared due to an attempt to access the site by individuals having possession of explosives
- Additional credible threats have been received

WHICH ONE of the following describes whether the TSC must be activated, and to where the Shift Manager must send the information for initial notification to county officials based on the above conditions?

	<u>Activate the TSC</u>	<u>County Notification Information</u>
a.	Yes	To Sec Alarm Station (SAS)
b.	Yes	To Emerg Op Facility (EOF)
c.	No	To Sec Alarm Station (SAS)
d.	No	To Emerg Op Facility (EOF)

ATTACHMENT ERP-200-1

Appendix ERP-200-1

Form 6: EMERGENCY DIRECTOR CHECK-OFF LIST

(Ref. ERP-200, Section 6.5.1)

(Page 2 of 5)

INITIAL ACTIONS	UNUSUAL EVENT	ALERT	SITE AREA	GENERAL
Implement ERP-140 Staffing Augmentation (NOTE ⁽¹⁾ : IF U.E. is due to a security event, THEN implement ERP-140.)	Opt ⁽¹⁾			
Start accident assessment log in MCR; event log in TSC (Ref. ERP-200 Sect. 6.5.3)				
Verify classification				
* Obtain wind direction and speed (NOTE: Wind direction should be reported out as "wind direction from" NOT to.)				
Consider performing analysis of release to determine isotopic mix for input into Mesorem, Jr. Obtain updates on dose projections and field survey data from DATL.				
Recommend PAR to Senior State Official(Prelude Ext. 116)	N/A	N/A	N/A	
<u>IF</u> General without prior classif. <u>THEN</u> include PAR on notification form	N/A	N/A	N/A	
If PEMA does not answer, just evacuate full EPZ	N/A	N/A	N/A	
* Fill out and sign Notification Form (ERP-200-1, Form 1)				
* Communicator start phone notification (except NRC) (ERP-110)				
* Direct NRC Communicator (licensed) contact NRC per ERP-110				
<u>IF</u> General with prior classifications <u>THEN</u> provide PAR to the Senior State Official (Prelude ext. 116) based on ERP-101 and ERP-300	N/A	N/A	N/A	
If the Senior State Official is not available contact counties and recommend shelter or evacuate full EPZ	N/A	N/A	N/A	
* Announce Emergency classification utilizing Appendix ERP-200-1, Form 2-5				
* Implement Station Evacuation if deemed appropriate (ERP-120)				

ATTACHMENT ERP-200-1

Appendix ERP-200-1

Form 6: EMERGENCY DIRECTOR CHECK-OFF LIST

(Ref. ERP-200, Section 6.5.1)

(Page 3 of 5)

INITIAL ACTIONS	UNUSUAL EVENT	ALERT	SITE AREA	GENERAL
Activate OSC (ERP-230) Release non-essential personnel from: Limerick Training Center Limerick Information Center	Opt			
If TSC is uninhabitable transfer TSC to MCR				
Prepare for Site Evacuation utilizing ERP-120: (Ref 6.5.5) Obtain met data from HP Tech/Dose Assessment Coordinator	N/A	Opt		
Select assembly area and exit route	N/A			
Inform Security Team Leader and Health Physics Team Leader	N/A			
Inform PEMA (Prelude ext. 116)	N/A			
Direct Health Physics Team Leader implement ERP-630	N/A			
Notify Assembly Area of Evacuation	N/A			
Announce evacuation from Main Control Room per ERP-120 step 2.3.	N/A			
Obtain TSC ERO Activation Checklist from EP Coordinator utilizing Form 10.				
Complete ED Turnover Form ERP-200-1, Form-8				

ATTACHMENT ERP-200-1

Appendix ERP-200-1

Form 6: EMERGENCY DIRECTOR CHECK-OFF LIST

(Ref. ERP-200, Section 6.5.1)

(Page 4 of 5)

CONTINUING ACTIONS	UNUSUAL EVENT	ALERT	SITE AREA	GENERAL
Notified of activation:				
OSC (ERP-230)	Opt			
EOF (ERP-C-1000)	N/A	Opt		
<p>WARNING: IN THE CASE OF AN ON-GOING SECURITY COMPROMISE THE GUIDANCE OF FORM 7 MAY BE USED TO EVALUATE OPERATING DECISIONS ON BOTH UNITS IN LIGHT OF NUCLEAR AND PERSONNEL SAFETY WHICH MAY BE AFFECTED BY SECURITY THREAT (REF A/R A0811805 AE-02)</p>				
Periodically Re-evaluate the need for local, partial, or site evacuations				
Periodically evaluate unaffected Unit Status using Appendix ERP-200-1, Form 7				
Obtain periodic status updates from team leaders				
If additional staffing required, Contact Support Personnel				
Announce emergency status changes over P.A.				
IF plant conditions warrant, implement Severe Accident Management (SAM) program.	N/A	N/A	N/A	
Verify with TSTL that SAM evaluators have been designated.	N/A	N/A	N/A	
Review recommendations from SAM evaluators for potential strategies to mitigate emergency.	N/A	N/A	N/A	
Direct implementation of selected SAM strategies.	N/A	N/A	N/A	

ATTACHMENT ERP-200-1

Appendix ERP-200-1

Form 6: EMERGENCY DIRECTOR CHECK-OFF LIST

(Ref. ERP-200, Section 6.5.1)

(Page 5 of 5)

CONTINUING ACTIONS	UNUSUAL EVENT	ALERT	SITE AREA	GENERAL
Notified of activation:				
OSC (ERP-230)	Opt			
EOF (ERP-C-1000)	N/A	Opt		
WARNING: IN THE CASE OF AN ON-GOING SECURITY COMPROMISE THE GUIDANCE OF FORM 7 MAY BE USED TO EVALUATE OPERATING DECISIONS ON BOTH UNITS IN LIGHT OF NUCLEAR AND PERSONNEL SAFETY WHICH MAY BE AFFECTED BY SECURITY THREAT (REF A/R A0811805 AE-02)				
Coordinate release of personnel from off-site assembly areas with Security Team Leader and Health Physics Team Leader				
Perform briefings/turnover Appendix ERP-200-1, Form 8				
Until relieved by ERM:				
Evaluate PAR's with Dose Assessment Coordinator:	N/A	N/A	N/A	
If modified, provide PAR's to Senior State Official (Prelude ext. 116)	N/A	N/A	N/A	

Answer Key and Question Data

Question # 65 (SRO)

Choice	Basis or Justification
a.	Correct per ERP-200-1
b-c-d	Incorrect. Staff augmentation is performed on Alert or higher for all EALs except security events, which require activation on UE or higher. Initial notifications are made from the secondary alarm station except for NRC
c.	
d.	

Required Attachments or Reference	Attachment Q65 – ERP-200-1 ED Checklist section only
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.?

Source Documentation			
Source:	New Exam Item		
Reference(s):	ERP-200-1		
Learning Objective:	LEPP-1200.		
Knowledge/Ability:	2.4.38	SRO Importance: 4.0	
(Description of K&A, from catalog)			
Ability to take actions called for in the facility emergency plan including (if required) supporting or acting as the emergency coordinator (Emergency Director at LGS)			

Prepared by: JMS

Question: 66

Attachment ERP-200-1, ERP-101, and ERP-300-9 are provided

Unit 2 plant conditions are as follows:

- LOCA with containment failure
- WRAM Total Effluent is 5×10^7 uCi/sec
- Drywell post-LOCA rad monitors indicate 3.1×10^5 R/hr
- Wind speed and direction are 10 mph from 180 degrees
- No prior event classification has been issued

WHICH ONE of the following is the PAR to be issued to the counties based on the above conditions?

	<u>PAR 2 to 5 miles (Evacuate)</u>	<u>PAR 5 to 10 miles (Evacuate)</u>
a.	"N" sector only	"N" sector only
b.	"N" sector only	"NNW", "N", "NNE" sectors
c.	All Sectors	"NNW", "N", "NNE" sectors
d.	All Sectors	All Sectors

ATTACHMENT ERP-200-1

Appendix ERP-200-1
Form 6: EMERGENCY DIRECTOR CHECK-OFF LIST
 (Ref. ERP-200, Section 6.5.1)
 (Page 2 of 5)

INITIAL ACTIONS	UNUSUAL EVENT	ALERT	SITE AREA	GENERAL
Implement ERP-140 Staffing Augmentation (NOTE ⁽¹⁾ : IF U.E. is due to a security event, THEN implement ERP-140.)	Opt ⁽¹⁾			
Start accident assessment log in MCR; event log in TSC (Ref. ERP-200 Sect. 6.5.3)				
Verify classification				
* Obtain wind direction and speed (NOTE: Wind direction should be reported out as "wind direction from" NOT to.)				
Consider performing analysis of release to determine isotopic mix for input into Mesorem, Jr. Obtain updates on dose projections and field survey data from DATL.				
Recommend PAR to Senior State Official (Prelude Ext. 116)	N/A	N/A	N/A	
<u>IF</u> General without prior classif. <u>THEN</u> include PAR on notification form	N/A	N/A	N/A	
If PEMA does not answer, just evacuate full EPZ	N/A	N/A	N/A	
* Fill out and sign Notification Form (ERP-200-1, Form 1)				
* Communicator start phone notification (except NRC) (ERP-110)				
* Direct NRC Communicator (licensed) contact NRC per ERP-110				
<u>IF</u> General with prior classifications <u>THEN</u> provide PAR to the Senior State Official (Prelude ext. 116) based on ERP-101 and ERP-300	N/A	N/A	N/A	
If the Senior State Official is not available contact counties and recommend shelter or evacuate full EPZ	N/A	N/A	N/A	
* Announce Emergency classification utilizing Appendix ERP-200-1, Form 2-5				
* Implement Station Evacuation if deemed appropriate (ERP-120)				

ATTACHMENT ERP-200-1

Appendix ERP-200-1

Form 6: EMERGENCY DIRECTOR CHECK-OFF LIST

(Ref. ERP-200, Section 6.5.1)

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INITIAL ACTIONS	UNUSUAL EVENT	ALERT	SITE AREA	GENERAL
Activate OSC (ERP-230) Release non-essential personnel from: Limerick Training Center Limerick Information Center	Opt			
If TSC is uninhabitable transfer TSC to MCR				
Prepare for Site Evacuation utilizing ERP-120: (Ref 6.5.5) Obtain met data from HP Tech/Dose Assessment Coordinator Select assembly area and exit route Inform Security Team Leader and Health Physics Team Leader Inform PEMA (Prelude ext. 116) Direct Health Physics Team Leader implement ERP-630 Notify Assembly Area of Evacuation Announce evacuation from Main Control Room per ERP-120 step 2.3.	N/A	Opt		
	N/A			
Obtain TSC ERO Activation Checklist from EP Coordinator utilizing Form 10.				
Complete ED Turnover Form ERP-200-1, Form-8				

ATTACHMENT ERP-200-1

Appendix ERP-200-1

Form 6: EMERGENCY DIRECTOR CHECK-OFF LIST

(Ref. ERP-200, Section 6.5.1)

(Page 4 of 5)

CONTINUING ACTIONS	UNUSUAL EVENT	ALERT	SITE AREA	GENERAL
Notified of activation:				
OSC (ERP-230)	Opt			
EOF (ERP-C-1000)	N/A	Opt		
WARNING: IN THE CASE OF AN ON-GOING SECURITY COMPROMISE THE GUIDANCE OF FORM 7 MAY BE USED TO EVALUATE OPERATING DECISIONS ON BOTH UNITS IN LIGHT OF NUCLEAR AND PERSONNEL SAFETY WHICH MAY BE AFFECTED BY SECURITY THREAT (REF A/R A0811805 AE-02)				
Periodically Re-evaluate the need for local, partial, or site evacuations				
Periodically evaluate unaffected Unit Status using Appendix ERP-200-1, Form 7				
Obtain periodic status updates from team leaders				
If additional staffing required, Contact Support Personnel				
Announce emergency status changes over P.A.				
<u>IF</u> plant conditions warrant, implement Severe Accident Management (SAM) program.	N/A	N/A	N/A	
Verify with TSTL that SAM evaluators have been designated.	N/A	N/A	N/A	
Review recommendations from SAM evaluators for potential strategies to mitigate emergency.	N/A	N/A	N/A	
Direct implementation of selected SAM strategies.	N/A	N/A	N/A	

ATTACHMENT ERP-200-1

Appendix ERP-200-1

Form 6: EMERGENCY DIRECTOR CHECK-OFF LIST

(Ref. ERP-200, Section 6.5.1)

(Page 5 of 5)

CONTINUING ACTIONS	UNUSUAL EVENT	ALERT	SITE AREA	GENERAL
Notified of activation:				
OSC (ERP-230)	Opt			
EOF (ERP-C-1000)	N/A	Opt		
WARNING: IN THE CASE OF AN ON-GOING SECURITY COMPROMISE THE GUIDANCE OF FORM 7 MAY BE USED TO EVALUATE OPERATING DECISIONS ON BOTH UNITS IN LIGHT OF NUCLEAR AND PERSONNEL SAFETY WHICH MAY BE AFFECTED BY SECURITY THREAT (REF A/R A0811805 AE-02)				
Coordinate release of personnel from off-site assembly areas with Security Team Leader and Health Physics Team Leader				
Perform briefings/turnover Appendix ERP-200-1, Form 8				
Until relieved by ERM:				
Evaluate PAR's with Dose Assessment Coordinator:	N/A	N/A	N/A	
If modified, provide PAR's to Senior State Official (Prelude ext. 116)	N/A	N/A	N/A	

Fission Product Barrier Table

3.1 Initiating Condition Matrix

CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	3.1.1 Applicable Opcons: 1, 2, 3 ANY Loss <u>OR</u> ANY Potential Loss of Primary Containment
ALERT	3.1.2 Applicable Opcons: 1, 2, 3 ANY Loss <u>OR</u> ANY Potential Loss of EITHER Fuel Clad <u>OR</u> RCS
SITE AREA EMERGENCY	3.1.3 Applicable Opcons: 1, 2, 3 Loss of BOTH Fuel Clad <u>AND</u> RCS <u>OR</u> Potential Loss of BOTH Fuel Clad <u>AND</u> RCS <u>OR</u> Potential Loss of EITHER Fuel Clad <u>OR</u> RCS, <u>AND</u> Loss of ANY Additional Barrier
GENERAL EMERGENCY	3.1.4 Applicable Opcons: 1, 2, 3 Loss of ANY Two Barriers <u>AND</u> Potential Loss of Third Barrier ***PAR*** Evacuate 2 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 2-5 miles. (See Fission Product Barrier Table 3.2 for exception based on extremely Hi Containment Radiation Levels.)

NOTES:

1. If a "Loss" condition is satisfied, the "Potential Loss" category can be considered satisfied. This is accounted for in the matrix contained in the Fission Product Barrier Table 3.2 used to determine the proper classification based on Fission Product Barrier status.
2. For all conditions listed in Fission Product Barrier Table 3.2, the barrier failure column is only satisfied if it fails when called upon to mitigate an accident. For example, failure of both containment isolation valves to isolate with a downstream pathway to the environment is only a concern during an accident. If this condition exists during normal power operations, it will be an active Technical Specification Action Statement. However, during accident conditions, this will represent a breach of containment.

3.2 Fission Product Barrier Status Table

Parameter	Fuel Clad		Reactor Coolant System		Primary Containment	
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
Reactor Coolant Activity	Reactor Coolant activity > 300 $\mu\text{Ci/gm}$ Dose Equivalent Iodine 131	N/A	N/A	N/A	N/A	N/A
RPV Level	RPV level < -186 "	RPV level < -161 "	RPV level < -161 "	N/A	N/A	RPV level cannot be restored above -186 " within the time limit of the "SAFE" region of the Maximum Core Uncovery Time Limit Curve (T-116, RF-1)
RPV Level Unknown	N/A	N/A	N/A	RPV level cannot be determined	N/A	RPV level cannot be determined AND RPV Flooding cannot be established as indicated by inability to maintain 5 ADS/SRVs open with RPV pressure at least 50 psig above Suppression Pool pressure per T-116
RCS Leak Rate	N/A	N/A	N/A	RCS leakage > 50 gpm	N/A	N/A
Drywell Pressure	N/A	N/A	Drywell Pressure > 1.68 psig AND Indication of a leak inside drywell	N/A	Rapid, unexplained decrease in Drywell Pressure following initial increase OR Drywell pressure response not consistent with LOCA conditions	Drywell Pressure > 44 psig and increasing OR Drywell Hydrogen > 6% AND Drywell Oxygen > 5%
Drywell Radiation	Drywell Rad Monitor reading > 4×10^4 R/hr	N/A	Drywell Rad Monitor reading > 15 R/hr	N/A	N/A	Drywell Rad Monitor reading > 3×10^5 R/hr ***PAR*** Evacuate 5 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 5-10 miles.

3.2 Fission Product Barrier Status Table

Parameter	Fuel Clad		Reactor Coolant System		Primary Containment	
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
Containment Isolation	N/A	N/A	N/A	Unisolable primary system leakage outside drywell as indicated by T-103, Max Safe Operating Temperature is exceeded in ONE area requiring a SCRAM OR Unisolable primary system leakage outside drywell as indicated by T-103, Max Safe Operating Radiation is exceeded in ONE area requiring a SCRAM	Failure of both valves in any one line to close AND downstream pathway to the environment exists OR Intentional venting per T-200 OR T-228 is required OR Unisolable primary system leakage outside drywell as indicated by T-103, Max Safe Operating Temperature is exceeded in ONE area requiring a SCRAM OR Unisolable primary system leakage outside drywell as indicated by a T-103, Max Safe Operating Radiation is exceeded in ONE area requiring a SCRAM	N/A
Emergency Director Judgement	Any condition in the judgement of the Emergency Director that indicates Loss or Potential Loss of the FUEL CLAD barrier		Any condition in the judgement of the Emergency Director that indicates Loss or Potential Loss of the RCS barrier		Any condition in the judgement of the Emergency Director that indicates Loss or Potential Loss of the Primary Containment barrier	

In the table below, circle all of the appropriate X's in each applicable row for each Loss or Potential Loss of Fission Product Barrier as determined by the table above.

Classify the event as identified in the table heading if all X's in a column under that heading are circled.

Fission Product Barrier Status	Unusual Event	ALERT				SITE AREA EMERGENCY						GENERAL EMERGENCY					
Fuel Clad - Loss		X				X		X		X				X	X		X
Fuel Clad - Potential Loss			X				X		(X)		X					X	
Reactor Coolant System - Loss				X		X			(X)			X		X	X	X	
Reactor Coolant System-Potential Loss					X		X	X				X					X
Primary Containment - Loss	X									X	X	X	X	X		X	X
Primary Containment - Potential Loss		X													X		

****PAR****

Evacuate 2 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 2-5 miles. (Upgrade PAR for D/W Rad > 3x10⁶ R/hr)

5.0 Radioactivity Release

5.1 Effluent Release and Dose

CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	<p>IC Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Radiological Technical Specifications for 60 Minutes or Longer</p> <p>5.1.1.a Applicable Opcons: ALL A valid reading on one or more of the following radiation monitors that exceeds TWO TIMES the HiHi alarm setpoint value for > 60 minutes: North Stack, South Stack, Radwaste Discharge, Service Water, RHRSW <u>AND</u> Calculated maximum offsite dose rate using computer dose model exceeds 0.114 mRem/hr TPARD OR 0.342 mRem/hr child thyroid CDE based on a 60 minute average Note: If the required dose projections cannot be completed within the 60 minute period, then the declaration must be made based on the valid sustained monitor reading.</p> <p>5.1.1.b Applicable Opcons: ALL Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates exceeding TWO TIMES Tech Specs (ODCM 3.2.2 and 3.2.3) for > 60 minutes</p>
ALERT	<p>IC Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times Radiological Technical Specifications for 15 Minutes or Longer</p> <p>5.1.2.a Applicable Opcons: ALL A valid reading on one or more of the following radiation monitors that exceeds TWO HUNDRED TIMES the HiHi alarm setpoint value for > 15 minutes: North Stack, South Stack, Radwaste Discharge, Service Water, RHRSW <u>AND</u> Calculated maximum offsite dose rate exceeds 11.4 mRem/hr TPARD OR 34.2 mRem/hr child thyroid CDE based on a 15 minute average Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading.</p> <p>5.1.2.b Applicable Opcons: ALL Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates exceeding TWO HUNDRED TIMES Tech Specs (ODCM 3.2.2 and 3.2.3) for > 15 minutes</p>

**E AREA
EMERGENCY**

IC Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mR Whole Body or 500 mR Child Thyroid for the Actual or Projected Duration of the Release

5.1.3 Applicable Opcons: ALL

A valid reading on one or more of the following radiation monitors that exceeds or is expected to exceed the value shown for **> 15 minutes** AND Dose Projections are not available:

North Stack 4.16E+6 μ Ci/second

South Stack 2.25E-3 μ Ci/cc

Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading.

OR

Projected offsite dose using computer dose model exceeds **100 mRem TPARD** OR **500 mRem child thyroid CDE**

OR

Analysis of Field Survey results indicate site boundary whole body dose rate exceeds **100 mRem/hr** expected to continue for more than one hour, OR Analysis of Field Survey results indicate child thyroid dose commitment of **500 mRem** for one hour of inhalation

**GENERAL
EMERGENCY**

IC Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity that Exceeds 1000 mR Whole Body or 5000 mR Child Thyroid for the Actual or Projected Duration of the Release Using Actual Meteorology

5.1.4 Applicable Opcons: ALL

A valid reading on one or more of the following radiation monitors that exceeds or is expected to exceed the value shown for **> 15 minutes** AND Dose Projections are not available:

North Stack 4.16E+7 μ Ci/second

South Stack 2.25E-2 μ Ci/cc

Note: If the required dose projections cannot be completed within the 15 minute period, then the declaration must be made based on the valid sustained monitor reading.

OR

Projected offsite dose using computer dose model exceeds **1000 mRem TPARD** OR **5000 mRem child thyroid CDE**

OR

Analysis of Field Survey results indicate site boundary whole body dose rate exceeds **1000 mRem/hr** expected to continue for more than one hour, OR Analysis of Field Survey results indicate child thyroid dose commitment of **5000 mRem** for one hour of inhalation

*****PAR*****

Evacuate 2 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 2-5 miles.

NOTE: CDE = Committed Dose Equivalent, TPARD = Total Protective Action Recommendation Dose

7.0 Internal Events

7.3 Loss of Assessment / Communication Capability

CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	<p>IC Unplanned Loss of Most or All Safety System Annunciation or Indication in The Control Room for Greater Than 15 Minutes</p> <p>7.3.1.a Applicable Opcons: 1, 2, 3</p> <p>Unplanned loss of most or all safety system annunciators (Table 7-1) <u>OR</u> indicators (Table 7-2) for > 15 minutes requiring increased surveillance to safely operate the unit(s).</p> <p>IC Unplanned Loss of All Onsite or Offsite Communications Capabilities</p> <p>7.3.1.b Applicable Opcons: ALL</p> <p>Loss of ALL Onsite communications (Table 7-3) affecting the ability to perform routine operations <u>OR</u> Loss of ALL Offsite communications (Table 7-3)</p>
ALERT	<p>IC Unplanned Loss of Most or All Safety System Annunciation or Indication In Control Room With Either (1) a Significant Transient in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable</p> <p>7.3.2 Applicable Opcons: 1, 2, 3</p> <p>Unplanned loss of most or all safety system annunciators (Table 7-1) <u>OR</u> indicators (Table 7-2) for > 15 minutes requiring increased surveillance to safely operate the unit(s) <u>AND EITHER</u> A significant plant transient is in progress (Table 7-4) <u>OR</u> the plant monitoring system (PMS) is unavailable.</p>
SITE AREA EMERGENCY	<p>IC Inability to Monitor a Significant Transient in Progress</p> <p>7.3.3 Applicable Opcons: 1, 2, 3</p> <p>Loss of safety system annunciators (Table 7-1) <u>AND</u> indicators (Table 7-2) <u>AND</u> PMS <u>AND</u> a significant plant transient is in progress. (Table 7-4)</p>
GENERAL EMERGENCY	None

Table 7-1 Safety System Annunciators

S

Containment Isolation
Reactor Trip
Process Radiation Monitoring

Table 7-2 Safety Function Indicators

Reactor Power
Decay Heat Removal
Containment Safety Functions

Table 7-3 Communications

	Onsite	Offsite
Site Phones (Dimension 2000)	X	X
PRELUDE System	X	X
Plant Public Address	X	
Station Radio	X	
NRC (FTS-2000)		X
PA State Police Radio		X
County Police Radio		X
Load Dispatcher Radio		X
PECO Dial Network		X

Table 7-4 Significant Plant Transients

SCRAM
Recirc Runbacks > 25% thermal power
Sustained power oscillations 25% peak to peak
Stuck open relief valve(s)
ECCS injection

8.0 External Events

8.1 Security Threats

CLASSIFICATION	EMERGENCY ACTION LEVEL
UNUSUAL EVENT	<p>IC Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant</p> <p>8.1.1 Applicable Opcons: ALL A credible threat to the station reported by the NRC. <u>OR</u> An actual threat that meets ALL of the following criteria:</p> <ul style="list-style-type: none"> • A credible threat reported by any other outside agency or determined per SY-AA-101-132; <u>AND</u> • Is specifically directed towards the station; <u>AND</u> • Is imminent (within 2 hours). <p><u>OR</u> Attempted intrusion and attack to the Protected Area <u>OR</u> Attempted sabotage discovered within the Protected Area <u>OR</u> Hostage/Extortion situation that threatens normal plant operations</p>
ALERT	<p>IC Security Event in a Plant Protected Area</p> <p>8.1.2 Applicable Opcons: ALL Intrusion into plant protected area by a hostile force <u>OR</u> Confirmed bomb, sabotage or sabotage device discovered in the Protected Area</p>
SITE AREA EMERGENCY	<p>IC Security Event in a Plant Vital Area</p> <p>8.1.3 Applicable Opcons: ALL Intrusion into plant Vital area by a hostile force <u>OR</u> Confirmed bomb, sabotage or sabotage device discovered in a Vital Area</p>
GENERAL EMERGENCY	<p>IC Security Event Resulting in Loss of Ability to Reach and Maintain Cold Shutdown</p> <p>8.1.4 Applicable Opcons: ALL Loss of physical control of the control room due to security event <u>OR</u> Loss of physical control of the remote shutdown capability due to security event ***PAR*** Evacuate 2 mile radius, evacuate affected sector(s) and 2 adjacent sectors for 2-5 miles.</p>

ATTACHMENT ERP-300-9

PROTECTIVE ACTION WORKSHEET

SECTION I

TO BE COMPLETED BY DOSE ASSESSMENT TEAM:

DATE: _____ TIME: _____ WINDSPEED: _____ mph DIRECTION (FROM): _____ °

DOSE ASSESSMENT RECOMMENDATIONS:

BAND 0-2 Miles _____ 2-5 Miles _____ 5-10 Miles _____ > 10 Miles _____

AFFECTED SECTORS AND SECTOR ON EITHER SIDE OF AFFECTED SECTORS FROM MESOREM PRINTOUT _____

Ingestion Pathway Recommendations _____ Dose Ratio (Mesorem Jr.) _____

SECTION II

TO BE COMPLETED BY EMERGENCY DIRECTOR:

PLANT STATUS RECOMMENDATIONS: (ERP-101)

0-2 Miles _____ 2-5 Miles _____ 5-10 Miles _____

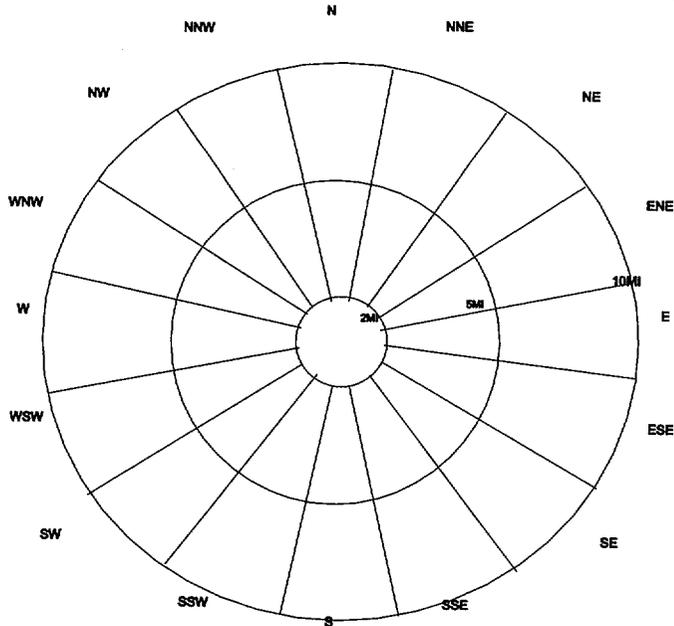
SECTION III

TO BE COMPLETED BY EMERGENCY DIRECTOR: ACTIONS RECOMMENDED TO STATE:

DOSE	PROTECTIVE ACTIONS	SECTORS
0-2 Miles		
2-5 Miles		
5-10 Miles		
>10 Miles		

Ingestion Pathway Recommendations _____ Dose Ratio (Mesorem Jr.) _____

- NOTES: 1. IF TOTAL PROJECTED TPARD IS LESS THAN 5 REM AND TOTAL PROJECTED CDE IS LESS THAN 25 REM SHELTER PAR MAY BE SUBSTITUTED FOR EVACUATE PAR FOR UNIQUE CIRCUMSTANCES (WEATHER/ROAD COND/ETC.)
2. INCLUDE AFFECTED SECTORS FROM PREVIOUS PAR IN ANY REVISED PAR.



MARK AFFECTED AREAS:

- SHELTER
- EVACUATE

COMPLETED BY/TIME _____ / _____

Answer Key and Question Data

Question # 66 (SRO)	
Choice	Basis or Justification
a-b-d	Incorrect The PAR from ERP 101 is evacuate all sectors 0-5 miles and affected +2 adjacent 5-10
c.	Correct

Required Attachments or Reference	Attachment ERP-101- Boundary degradation section + Effluent section Attachment ERP-200-1 ERP-200-1 Checklist section only Attachment ERP-300-9 ERP-300 Appendix 9 – Compass rose
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Psychometrics		
Cognitive (H, L)	H	SRO
		10CFR55.43.b.5

Source Documentation	
Source:	New Exam Item
Reference(s):	ERP-101, 200-1, 300-9
Learning Objective:	LEPP1200.
Knowledge/Ability:	2.4.44
	SRO Importance: 4.0
(Description of K&A, from catalog)	
Knowledge of emergency plan protective action recommendations	

Prepared by: JMS

Question: 67

Attachment T-111 is provided

Unit 2 plant conditions are as follows:

- SCRAM and loss of ALL RPV injection sources
- RPV water level is -162 inches and dropping
- RPV pressure band is 800 to 900 psig, with the recorded value 900 psig
- RPV pressure is 805 psig and slowly rising

Efforts to restore a CRD pump are in progress with the pump NOT yet running

WHICH ONE of the following describes the future trend in fuel cladding temperature at the top of the bundles as the event progresses based on the above conditions?

- a. Increases until ADS SRVs are opened at the Minimum Zero Injection RPV Water Level
- b. Increases until A, C, and N SRVs are opened at the Minimum Steam Cooling RPV Water Level
- c. Decreases until the A, C, and N SRVs are opened at the Minimum Steam Cooling RPV Water Level
- d. Decreases until ADS SRVs are opened at the Minimum Zero Injection RPV Water Level

Answer Key and Question Data

Question # 67 (SRO)

Choice	Basis or Justification
a.	Correct per T-111. The candidate must assess the indications, conclude that steam cooling is already in progress, and determine the required actions (ADS) at the appropriate RPV level. The basis for the steam cooling blowdown is the point where clad temp reached 1800 degrees. Clad temp rises from the point of uncover to blowdown.
b-c-d	Incorrect. Wrong direction for clad temp or wrong limit of Minimum Steam Cooling RPV Water Level, which is only valid with injection.

Required Attachments or Reference	T-111 Level Restoration Flowchart
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Psychometrics

Cognitive (H, L)	H		SRO
			10CFR55.43.b.5

Source Documentation

Source:	New Exam Item		
Reference(s):	T-111		
Learning Objective:	LLOT1550.05		
Knowledge/Ability:	295009AA2.01	SRO Importance:	4.2
(Description of K&A, from catalog) Ability to determine and/or interpret Reactor water level as it relates to Low Reactor Water Level			

Prepared by: JMS

Question: 68

Attachment T-102 is provided

Unit 1 plant conditions are as follows:

- LOCA in progress
- MSIVs are closed
- RPV level is +30 inches
- RPV pressure is 700 psig
- The PRO reports SPOTMOS reads 185 °F

WHICH ONE of the following describes the depressurization strategy and the method for level control based on the above conditions?

	<u>RPV Cooldown</u>	<u>Level Control</u>
a.	Normal rate cooldown	CRD and Condensate
b.	Normal rate cooldown	HPCI and SLC
c.	Emergency blowdown	CRD and Condensate
d.	Emergency blowdown	HPCI and SLC

Answer Key and Question Data

Question # 68 (SRO)

Choice	Basis or Justification
a-b-d	Incorrect. Emergency Blowdown is required and HPCI is required to be secured.
c.	Correct. Emergency blowdown required for HCTL. HPCI should be secured due to high pool temp.

Required Attachments or Reference	T-102 Sheet 1 with entry conditions removed
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Psychometrics

Cognitive (H, L)	H		SRO
			10CFR55.43.

Source Documentation

Source:	New Exam Item		
Reference(s):	T-102		
Learning Objective:	LLOT1550.06		
Knowledge/Ability:	295013AA2.01	SRO Importance:	4.0
(Description of K&A, from catalog) Ability to determine and/or interpret suppression pool temperature as it relates to High Suppression Pool Temperature			

Prepared by: JMS

Question: 69

Attachment T-117 is provided

Unit 2 plant conditions are as follows:

- SCRAM signal due to steam leak in the drywell
- Drywell pressure is 3.0 psig
- Reactor power is 10%
- RPV water level is 35 inches
- SRVs are all closed
- Main turbine is on line
- Suppression pool temperature is 97 °F

WHICH ONE of the following is the RPV level control band to be issued based on the above conditions?

- a. +12.5 to +54 inches
- b. - 55 to +54 inches
- c. - 60 to -100 inches
- d. - 161 to -201 inches

Answer Key and Question Data

Question # 69 (SRO)

Choice	Basis or Justification
a.	Incorrect. Based on mis-diagnosis of power
b.	Incorrect. Based on correct low end but incorrect L8 high end
c.	Correct per T-117
d.	Incorrect base on misdiagnosis of SP/T and early level reduction

Required Attachments or Reference	T-117 flowchart
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Psychometrics

Cognitive (H, L)	H		SRO
			10CFR55.43.b.5

Source Documentation

Source:	Direct LGS Exam Bank #812		
Reference(s):	T-117		
Learning Objective:	LLOT1560.06		
Knowledge/Ability:	295015	SRO Importance: 4.0	
(Description of K&A, from catalog)			
Knowledge of symptom based EOP mitigation strategies as it applies to Incomplete SCRAM			

Prepared by: JMS

Question: 70

Plant conditions are as follows:

- The MCR has become uninhabitable due to smoke while at 100% power
- Operators only had sufficient time to complete the Immediate Operator Actions required before exiting the MCR

WHICH ONE of the following describes the status of RPV pressure control and RPV Injection while the operators are relocating to the RSP based on the above conditions?

	<u>RPV Pressure Control</u>	<u>RPV Injection</u>
a.	Turbine bypass valves in automatic	RCIC due to manual initiation
b.	Turbine bypass valves in automatic	Control Rod Drive pumps
c.	SRVs only	RCIC due to manual initiation
d.	SRVs only	Control Rod Drive pumps

Answer Key and Question Data

Question # 70 (SRO)

Choice	Basis or Justification
a-b-c	Incorrect. The Immediate Actions are to Scram the reactor, Place mode sw to SHUTDOWN, Trip the turbine, and close the MSIVs. RCIC startup is a follow-up action which may not be completed prior to exiting.
d.	Correct per SE-1 Immediate actions. Required memory knowledge.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L		SRO
			10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	SE-1, REMOTE SHUTDOWN		
Learning Objective:	LLOT1563.01, 02		
Knowledge/Ability:	295016 2.4.49	SRO Importance:	4.0
(Description of K&A, from catalog)			
Ability to perform without reference to procedures those actions that require immediate operation of facility components and controls during Control Room Abandonment			

Prepared by: JMS

Question: 71

Unit 1 plant conditions are as follows:

- OPCON 5 with core alterations in progress
- RPV drain-down event with ECCS failure occurs
- Operators recovered a single core spray pump and restored level

WHICH ONE of the following lists the RPV water level that—if reached—will require a report of safety limit violation and the associated time for contacting the NRC Operations Center based on the above conditions?

	<u>RPV Water Level</u>	<u>Report to NRC Operations Center within</u>
a.	Top of Active Fuel	1 hour
b.	Top of Active Fuel	24 hours
c.	2/3 Core Height	1 hour
d.	2/3 Core Height	24 hours

Answer Key and Question Data

Question # 71 (SRO)	
Choice	Basis or Justification
a.	Correct per LGS TS. The TAF safety limit is a refueling mode SL.
b-c-d	Incorrect. 2/3 core height is the point where cladding damage is expected per the T/S bases. 24 hours is the internal LGS reporting requirement to plant management and the NRB

Required Attachments or Reference	T/S 6.7.1
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Psychometrics			
Cognitive (H, L)	L		SRO
			10CFR55.43.b.1

Source Documentation	
Source:	New Exam Item
Reference(s):	Tech Specs SL and 6.7.1
Learning Objective:	LLOT1800.04
Knowledge/Ability:	295023 2.2.22
(Description of K&A, from catalog)	
Knowledge of limiting conditions for operations and safety limits as it relates to Refueling Accidents Cooling Mode	
SRO Importance: 4.1	

Prepared by: JMS

Question: 72

Unit 2 plant conditions are as follows:

- LOCA in progress
- Drywell pressure is 28 psig and rising
- Suppression Pool Pressure is 25 psig and rising
- Suppression Pool Level is 24 feet
- RPV level is being maintained with RHR and Core Spray

WHICH ONE of the following describes the required actions and the reason based on the above conditions?

- a. Direct a controlled cooldown because ECCS NPSH and vortex limits are exceeded
- b. Direct a controlled cooldown because steam is bypassing the containment downcomers
- c. Direct an emergency RPV blowdown because ECCS NPSH and vortex limits are exceeded
- d. Direct an emergency RPV blowdown steam is bypassing the containment downcomers

Answer Key and Question Data

Question # 72 (SRO)	
Choice	Basis or Justification
a-b-c	Incorrect. The required action is a blowdown because steam is bypassing the containment suppression function.
d.	Correct. The correct interpretation of the pressure in the airspace is that it exceeds the PSP and therefore steam is in the airspace. A blowdown is required

Required Attachments or Reference	T-102
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	T-102		
Learning Objective:	LLOT1560.06		
Knowledge/Ability:	295024EA2.04	SRO Importance:	3.9
(Description of K&A, from catalog)			
Ability to determine and/or interpret suppression chamber airspace pressure as it relates to high drywell pressure			

Prepared by: JMS

Question: 73

Attachment T-102 is provided

Unit 1 plant conditions are as follows:

- ATWS is in progress
- Reactor Power is 27%
- "1A" RHR Pump suction temperature is 170°F with suppression pool cooling in service
- Suppression Pool level is 15 feet
- SPOTMOS indicates 180 °F
- RHRSW HX Outlet temperature is 150 °F
- RHR HX Outlet temperature is 165 °F

WHICH ONE of the following describes the actual Suppression Pool temperature?

- a. 150 °F
- b. 165° F
- c. 170° F
- d. 180° F

Answer Key and Question Data

Question # 73 (SRO)	
Choice	Basis or Justification
a-b-d	Per T-102, PRIMARY CONTAINMENT CONTROL Note #2. Pool temperature probes are uncovered below 17.8 ft and RHR suction temperature must be used.
c.	Correct

Required Attachments or Reference	T-102 Flowchart
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	T-102		
Learning Objective:	LLOT1560.4		
Knowledge/Ability:	295026EA2.02	Importance: RO 3.8 / SRO 3.9	
(Description of K&A, from catalog)			
Ability to determine and/or interpret the following as they apply to Suppression Pool High Water Temperature: Suppression pool level.			

Prepared by: CBG

Question: 74

Unit 1 is at 100% power when the following sequence of events occurs:

- HPCI inadvertently starts and injects
- NEUTRON MONITORING TRIP annunciator has alarmed
- APRM UPSCALE TRIP / INOP annunciator has alarmed
- APRM 1 and 3 UPSCALE TRIP / INOP status lights are on
- All eight white scram indicating lights on 10C603 are lit

WHICH ONE of the following actions must be taken based on the above conditions?

- a. Insert a manual half scram on the affected RPS side
- b. Conduct a controlled plant shutdown (GP-3)
- c. Conduct an rapid plant shutdown (GP-4)
- d. Insert a manual full SCRAM

Answer Key and Question Data

Question # 74 (SRO)	
Choice	Basis or Justification
a.-c.	Incorrect, conditions stated indicate a parameter exceeding it RPS setpoint with no RPS actuation. This condition requires an immediate full scram per the immediate actions of OT-117.
d.	Correct

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.5

Source Documentation	
Source:	New Exam Item
Reference(s):	OT-117
Learning Objective:	LLOT1540.2
Knowledge/Ability:	295037G2.4.48
	Importance: RO 4.0 / SRO 4.0
(Description of K&A, from catalog) Ability to perform without reference to procedures those actions that require immediate operation of system components and controls: SCRAM Condition Present and Power Above APRM Downscale or Unknown	

Prepared by: CBG

Question: 75

Plant conditions are as follows:

- 100% power on both units
- No fuel handling or movement of loads is taking place in either fuel pool
- RE-26-2N011C, "C" Channel Refuel Floor Exhaust Rad Instrument has failed a surveillance

I&C has requested to take the instrument out of operate, which will trip the channel

WHICH ONE of the following lists whether the instrument is required to be OPERABLE and the response if the "C" channel is tripped based on the above conditions?

	<u>Required to be OPERABLE</u>	<u>Isolation Response if Tripped</u>
a.	Yes	Refuel Floor Isolation
b.	Yes	H ₂ O ₂ Analyzer Isolation
c.	No	Refuel Floor Isolation
d.	No	H ₂ O ₂ Analyzer Isolation

Answer Key and Question Data

Question # 75 (SRO)	
Choice	Basis or Justification
a-b-c	Incorrect. The refuel floor requires at least two instruments to trip for an isolation and the instruments are not required to be operable per the LCO applicable conditions
d.	Correct. Not required to be operable under the given the conditions, but Group 6C sample isolation valves are single channel isolation valves, and DIV 3 valves will close.

Required Attachments or Reference	T/S Isol Act. Instr
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Psychometrics			
Cognitive (H, L)	H		SRO
			10CFR55.43.b.1

Source Documentation			
Source:	New Exam Item		
Reference(s):	LCO 3.3.2		
Learning Objective:	LLOT0200.07, 13		
Knowledge/Ability:	295034 2.2.22	SRO Importance:	4.1
(Description of K&A, from catalog)			
Knowledge of limiting conditions for operation and safety limits related to High Secondary Containment Ventilation High Radiation			

Prepared by: JMS