

Question: 01

01 of 100

Unit 2 plant conditions are as follows:

- Reactor power is 35%
- The main generator is loaded on the grid

The drain valve for the "A1" Moisture Separator fails closed, and the associated dump valve fails to open. Annunciator windows E-2 (A1 MOISTURE SEPARATOR DRAIN TANK HI LEVEL) and E-1 (MOISTURE SEPARATOR HI LEVEL TRIP) on 206 MAIN STEAM have alarmed.

WHICH ONE of the following describes the expected plant response?

- a. "A" RPS channel de-energizes; "B" RPS channel remains energized
- b. "B" RPS channel de-energizes; "A" RPS channel remains energized
- c. Both "A" and "B" RPS channels remain energized
- d. Both "A" and "B" RPS channels de-energize

Answer Key and Question Data	
Question # <u>01</u>	
Choice	Basis or Justification
a.	Incorrect - since both A and B RPS will de-energize
b.	Incorrect - since both A and B RPS will de-energize
c.	Incorrect - since both A and B RPS will de-energize
d.	Correct Answer - High-High level in any one moisture separator will cause the main turbine to trip. A turbine trip at greater than 30% power will result in a full scram (A and B RPS de-energize)

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation	
Source:	New Exam Item
Reference(s):	ARC-MCR-206, E-1
Learning Objective:	LLOT0560.10
Knowledge/Ability:	295005 AK2.01
Importance: 3.8/3.9	
(Description of K&A, from catalog) Knowledge of the interrelations between MAIN TURBINE GENERATOR TRIP and the following: RPS	

Prepared by: Craig Fritz

Question: 02

02 of 100

Unit 1 plant conditions are as follows:

- 100% reactor power
- Normal electrical lineup

A loss of offsite power occurs and all Unit 1 and Unit 2 Diesel Generators cannot be started.

WHICH ONE of the following describes systems available for RPV level and pressure control three minutes after the Station Blackout?

	<u>Level Control</u>	<u>Pressure Control</u>
a.	HPCI	SRVs
b.	Reactor Feedwater Pumps	SRVs
c.	HPCI	Main Turbine Bypass Valves
d.	Reactor Feedwater Pumps	Main Turbine Bypass Valves

Answer Key and Question Data	
Question # 02	
Choice	Basis or Justification
a.	Correct Answer – HPCI is available for level control as it does not need AC power to function. SRVs are available for pressure control as they only need Div 1 DC power to function from the MCR.
b.	Incorrect – Reactor Feedwater pumps will all trip on low suction pressure when the condensate pumps trip on loss of power
c.	Incorrect – Bypass valves are not available after one minute due to loss of EHC pumps (accumulators only provide about 1 minute of operation after trip of the EHC pumps)
d.	Incorrect – Bypass valves are not available after one minute due to loss of EHC pumps (accumulators only provide about 1 minute of operation after trip of the EHC pumps)

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation	
Source:	New Exam Item
Reference(s):	E-1
Learning Objective:	LLOT1566.02
Knowledge/Ability:	295003 AK1.06
(Description of K&A, from catalog)	
Knowledge of the operational implications of the following as they apply to partial or complete loss of AC power: Station blackout	
Importance: 3.8/4.0	

Prepared by: Lee Stanford

Question: 03

03 of 100

Unit 1 plant conditions are as follows:

- Drywell Pressure 2.0 psig rising slowly
- Drywell Temperature 150 ° F rising slowly
- Rx Shut down per GP 4 "Rapid Plant Shutdown to Hot Standby"
- "1A" Drywell Chiller in service
- "1A" and "1B" Chilled Water Pumps running
- 8 Drywell fans are running
- All automatic actions occur as designed

No other operator actions performed.

WHICH ONE of the following actions is permissible to lower Drywell Temperature for the conditions above?

- a. Reset DWCW Isolations per GP 8.3, ISOLATION RESETS
- b. Bypass DWCW Isolations per GP 8.5, ISOLATION BYPASS OF CRUCIAL SYSTEMS
- c. Start "1B" Chiller per S87.1.A, STARTUP OF DRYWELL CHILLED WATER SYSTEM
- d. Place Drywell Spray in service per T-225, STARTUP AND SHUTDOWN OF SUPPRESSION POOL AND DRYWELL SPRAY

Answer Key and Question Data	
Question # <u>03</u>	
Choice	Basis or Justification
a.	Incorrect – DWCW Isolation can not be reset with Drywell pressure greater than 1.68 psig
b.	Correct Answer – 1.68 psig isolates Drywell chill water to drywell. Must Bypass isolations per GP 8.5 per T-102
c.	Incorrect – The definition for T-102 "Maximize Drywell Cooling" requires only one Drywell Chiller in service
d.	Incorrect – Drywell Spray is not permissible with the given Drywell parameters

Required Attachments or Reference	T-102
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-102, OT-101	
Learning Objective:	LLOT1560.5	
Knowledge/Ability:	295012 A1.02	Importance: 3.8/3.8
(Description of K&A, from catalog) Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell cooling system		

Prepared by: Tim Kan

Question: 04

04 of 100

Unit 2 plant conditions are as follows:

- 100% reactor power
- RHR is aligned normally

An inadvertent Division 1 LOCA signal is generated by an instrument line failure. No actions are taken by MCR Operators.

WHICH ONE of the following describes the expected position of the "2A" RHR pump "MINIMUM FLOW VALVE", HV-51-2F007A and "HEAT EXCHANGER BYPASS VALVE", HV-51-2F048A five (5) minutes later?

	<u>HV-51-2F007A position</u>	<u>HV-51-2F048A position</u>
a.	Open	Open
b.	Open	Closed
c.	Closed	Open
d.	Closed	Closed

Answer Key and Question Data

Question # 04

Choice	Basis or Justification
a.	Correct Answer – HV-51-2F007A is normally open when RPV pressure is greater than 75 psig, with its handswitch in AUTO. The valve will only close if RHR flow is greater than 1300 gpm. The LOCA signal will start the "2A" RHR pump, but no other valves will open to allow flow to exceed 1300 gpm at the flow switch controlling HV-51-2F007A, therefore, the valve will remain open to provide minimum flow protection for the pump. HV-51-2F048A will receive an open signal for three minutes from the LOCA signal, and will not automatically close at the end of that three minutes. Therefore, with no operator action, both valves will be open at the end of five minutes.
b.	Incorrect – See justification for a.
c.	Incorrect – See justification for a.
d.	Incorrect – See justification for a.

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	P&I M-51	
Learning Objective:	LLOT0370.08	
Knowledge/Ability:	203000 K4.03	Importance: 3.2/3.3
(Description of K&A, from catalog)		
Knowledge of RHR/LPCI: INJECTION MODE design feature(s) and/or interlocks which provide for the following: Pump minimum flow protection		

Prepared by: Craig Fritz

Question: 05

05 of 100

ATTACHMENT Q05 IS PROVIDED

Unit 1 plant conditions are as follows:

- Inadvertent RCIC initiation has occurred
- RCIC has been shutdown
- OT-104 actions have been performed
- Reactor power is 99%
- A P-1 has been demanded (see attached P-1)

WHICH ONE of the following, for the attached P-1, is a condition that requires reporting to the CRS?

- a. AGAF needs adjustment
- b. Exceeding rated thermal power
- c. A thermal limit is being exceeded
- d. Control rod 38-31 is not in the correct position

Answer Key and Question Data	
Question # <u>05</u>	
Choice	Basis or Justification
a.	Incorrect – AGAF are all reading 0.999. They do not need adjustment unless they are outside 0.98 – 1.02
b.	Incorrect – Thermal power is not exceeded on Unit 1 unless above 3440 MW thermal per GP-5.
c.	Correct Answer – MAPRAT is being exceeded at location 45-16.
d.	Incorrect – Control rod 38-31 is in the same position as its symmetric rods.

Required Attachments or Reference	P1 print out
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	T.S. GP-14	
Learning Objective:	LLOT0740.2	
Knowledge/Ability:	G.2.1.19	Importance: 3.0/3.0
(Description of K&A, from catalog) Ability to use plant computer to obtain and evaluate parametric information on system or component status.		

Prepared by: Tim Kan

Question: 06

06 of 100

Unit 1 plant conditions are as follows:

- RPV level is -140 inches and lowering slowly
- RPV pressure is 490 psig and lowering slowly
- Drywell pressure is 20 psig and rising slowly
- All low pressure ECCS pumps are running
- A LOCA signal was generated five (5) minutes ago
- Auto ADS has NOT been inhibited

No operator actions have been taken.

WHICH ONE of the following describes the status of the Safety Relief Valves (SRVs)?

- a. All fourteen (14) SRVs are open
- b. All fourteen (14) SRVs are closed
- c. A, C, and N SRVs are open, all others are closed
- d. E, H, K, M, S SRVs are open, all others are closed

Answer Key and Question Data	
Question # <u>06</u>	
Choice	Basis or Justification
a.	Incorrect – only high pressure (above the lift setpoints of 1170, 1180, and 1190 psig) will cause all 14 SRVs to open automatically.
b.	Incorrect – conditions given will provide an ADS initiation signal, which will open the 5 ADS/SRVs
c.	Incorrect – C, A, and N SRVs are the SRVs that can be operated from the Remote Shutdown Panel, but they will not open automatically.
d.	Correct Answer – These are the 5 ADS valves, and they will open automatically based on the given conditions.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-112 Bases	
Learning Objective:	LLOT0330. 5	
Knowledge/Ability:	239002 K1.08	Importance: 4.0/4.1
(Description of K&A, from catalog)		
Knowledge of the physical connections and/or cause-effect relationships between RELIEF/SAFETY VALVES and the following: Automatic depressurization system		

Prepared by: Craig Fritz

Question: 07

07 of 100

Unit 1 plant conditions are as follows:

- ATWS in progress
- Squib valves fail to fire

An Equipment Operator is directed to perform T-212, Bypassing Squib Valves For Injection.

WHICH ONE of the following describes where the Equipment Operator would retrieve the procedure and what is required to verify proper revision for the conditions above?

	<u>T-200 Locker Location</u>	<u>Revision Verification</u>
a.	OSC	Must verify revision number in PIMS
b.	FOF	Must verify red "Controlled Copy" stamped
c.	OSC	Must verify red "Controlled Copy" stamped
d.	FOF	Must verify revision number in PIMS

Answer Key and Question Data	
Question # <u>07</u>	
Choice	Basis or Justification
a.	Incorrect – see “c” justification
b.	Incorrect – see “c” justification
c.	Correct Answer – T-200 locker is in RP field office and all procedures in locker are kept current and red stamped by records management.
d.	Incorrect – see “c” justification

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	HU-AA-104-101, RM-AA-102	
Learning Objective:	LLOT1570 5	
Knowledge/Ability:	Generic 2.1.21	Importance: 3.1/3.2
(Description of K&A, from catalog) Ability to obtain and verify controlled procedure copy		

Prepared by: Tim Kan

Question: 08

08 of 100

Unit 1 plant conditions are as follows:

- OPCON 3
- HPCI operating for RPV level and pressure control

Suppression Pool level is reported to be 20 feet and lowering.

WHICH ONE of the following identifies the Suppression Pool level at which HPCI must be secured and the reason it must be secured?

	<u>Suppression Pool Level</u>	<u>Reason</u>
a.	13.5 ft.	Prevent exceeding NPSH and vortex limits
b.	13.5 ft.	Prevent containment pressurization
c.	18 ft.	Prevent exceeding NPSH and vortex limits
d.	18 ft.	Prevent containment pressurization

Answer Key and Question Data

Question # 08

Choice	Basis or Justification
a.	Incorrect (see explanation for "d")
b.	Incorrect (see explanation for "d")
c.	Incorrect (see explanation for "d")
d.	Correct Answer. T-102, step SP/L-4 requires HPCI secured if suppression pool level cannot be maintained above 18 ft. T-102 Bases explains that it is to prevent direct pressurization of the suppression pool by the HPCI exhaust.

Required Attachments or Reference	T-102
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Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation

Source:	New Exam Item		
Reference(s):	T-102, Trip Bases		
Learning Objective:	LLOT1560.5		
Knowledge/Ability:	295030 EK3.02	Importance:	3.5/3.7
(Description of K&A, from catalog) Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: HPCI operation			

Prepared by: Craig Fritz

Question: 09

09 of 100

Unit 1 is operating at 100% reactor power with RPV level at +35 inches and steady.

A Unit 1 feedwater level control malfunction causes RPV water level to lower and stabilize at +5 inches with the following plant response:

RPS "SCRAM STATUS" lights A1, A2, A3, and A4 are lit on 10C603 panel.

RPS "SCRAM STATUS" lights B1, B2, B3, and B4 are NOT lit on 10C603 panel.

WHICH ONE of the following describes the status of Unit 1 RPS?

- a. Only "A" RPS is de-energized
- b. Only "B" RPS is de-energized
- c. "A" and "B" RPS are de-energized
- d. Neither "A" nor "B" RPS are de-energized

Answer Key and Question Data	
Question # <u>09</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – with "A" RPS lights still lit, "A" RPS has failed to de-energize. Therefore, only "B" RPS had de-energized
c.	Incorrect – See justification for b.
d.	Incorrect – See justification for b.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation			
Source:	New Exam Item		
Reference(s):	OT-117		
Learning Objective:	LLOT0300.08		
Knowledge/Ability:	295015 AA 1.02	Importance:	4.0/4.2
(Description of K&A, from catalog)			
Ability to operate and/or monitor the following as they apply to INCOMPLETE SCRAM: RPS			

Prepared by: Tim Kan

Question: 10

10 of 100

Unit 2 plant conditions are as follows:

- 100% reactor power
- "0B" MCR Chiller is in service
- D24 Diesel Generator in service for monthly run
- "2A" RHR Pump running in Suppression Pool Cooling Mode

"A" Recirc line ruptures which results in reactor level dropping to -150".

WHICH ONE of the following identifies an effect of reactor level dropping below the low low low reactor level setpoint?

- a. "2A" RHR Pump trips and restarts in 5 seconds
- b. "2B" Core Spray Pump auto starts in 10 seconds
- c. Control Enclosure Cooling will be lost for 167 seconds
- d. Cooling water for D24 Diesel Generator will be lost for 53 seconds

Answer Key and Question Data

Question # <u>10</u>	
Choice	Basis or Justification
a.	Incorrect. - Although "2A" RHR Pump does not auto start until 5 seconds after a LOCA signal, the pump will not trip a LOCA signal.
b.	Incorrect. - "2B" Core Spray Pump will start 15 seconds following a LOCA signal.
c.	Incorrect. - The MCR Chillers will only load shed on a Unit 1 LOCA signal since they are powered from Unit 1 4 KV power.
d.	Correct Answer - Any time a Diesel starts, the associated ESW Pump will run. However, due to load shedding on a LOCA, all ESW Pumps will trip and restart 53 seconds later. The Diesel will continue to run without cooling since ESW is the only supply of cooling water for the diesels.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	UFSAR Table 8.3-1(b), E-164, E-321, E-350, E-360, E-453	
Learning Objective:	LLOT0660.05	
Knowledge/Ability:	264000 K5.06	Importance: 3.4/3.5
(Description of K&A, from catalog) Knowledge of the operational implications of the following concepts as they apply to EMERGENCY GENERATORS (DIESEL/JET): Load sequencing		

Prepared by: Lee Stanford

Question: 11

11 of 100

D22 DG has just been synchronized with the 101 Safeguard Bus resulting in the following generator indications:

60.0 HZ
200 KW
200 KVAR
4280 KV

WHICH ONE of the following actions are required in accordance with S92.1.O, LOCAL AND REMOTE MANUAL STARTUP OF A DIESEL GENERATOR, to restore generator parameters within acceptable limits and the reason for this action?

- a. Lower reactive load using Voltage Regulator control to prevent generator overvoltage
- b. Lower reactive load using Speed Governor control to prevent generator winding overheating
- c. Raise real load using Voltage Regulator control to prevent generator overvoltage
- d. Raise real load using Speed Governor control to prevent generator winding overheating

Answer Key and Question Data

Question # 11

Choice	Basis or Justification
a.	Incorrect - action is to prevent generator winding overheating
b.	Incorrect - Voltage Regulator control is used to control reactive load
c.	Incorrect - Speed Governor is used to control real load
d.	Correct Answer

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	S92.1.O		
Learning Objective:	LLOT0670.2		
Knowledge/Ability:	264000 A2.04	Importance:	2.9/3.0
(Description of K&A, from catalog)			
Ability to predict the impact of the following on Emergency Generators and, based on those predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations:			
Consequences of operating under/over excited			

Prepared by: Lee Stanford

Question: 12

12 of 100

Unit 2 plant conditions are as follows:

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

The "2B" Reactor Feedwater Pump trips, and RPV level lowers to +25 inches.

WHICH ONE of the following describes the plant response, and the reason for this response?

- a. Both reactor recirculation pumps will runback to 28% speed;
reduces power to restore level by reducing steam load
- b. Both reactor recirculation pumps will runback to 42% speed;
reduces power to restore level by reducing steam load
- c. Both reactor recirculation pumps will runback to 28% speed;
reduces power to ensure adequate NPSH to recirculation pumps
- d. Both reactor recirculation pumps will runback to 42% speed;
reduces power to ensure adequate NPSH to recirculation pumps

Answer Key and Question Data	
Question # <u>12</u>	
Choice	Basis or Justification
a.	Incorrect – See explanation for b.
b.	Correct Answer – With any individual RFP flow less than 18.8%, and RPV level less than 27.5 inches, both recirc pumps will run back to 42% speed. This is for the purpose of reducing power to reduce steam flow to help turn RPV level.
c.	Incorrect – See explanation for b.
d.	Incorrect – See explanation for b.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):		
Learning Objective:	LLOT0040.03	
Knowledge/Ability:	295009 AK3.01	Importance: 3.2/3.3
(Description of K&A, from catalog) Knowledge of the reasons for the following responses as they apply to LOW REACTOR WATER LEVEL: Recirculation pump run back		

Prepared by: Craig Fritz

Question: 13

13 of 100

Unit 2 plant conditions are as follows:

- Reactor startup is in progress with reactor power at 11% and all prerequisites are met to go to OPCIION 1
- Reactor Mode Switch is in "STARTUP/HOT STANDBY"
- "2B" IRM is inoperable and is bypassed using the joystick on 20C603

The 2D IRM fails upscale.

WHICH ONE of the following conditions will permit the startup to continue?

- a. "2D" IRM is bypassed by placing the Reactor Mode Switch in "RUN"
- b. "2D" IRM is bypassed using the joystick on 20C603
- c. "2D" IRM drawer mode switch is placed to "TEST"
- d. "2D" IRM is fully withdrawn

Answer Key and Question Data

Question # 13

Choice	Basis or Justification
a.	Correct Answer. - Placing the Reactor Mode Switch in RUN will bypass all SRM and IRM trips and rod blocks.
b.	Incorrect - only one IRM on the "B" side (B, D, F, or H) can be bypassed at one time. Therefore, if D is bypassed, B cannot be bypassed, and will result in a rod withdraw block.
c.	Incorrect - If the drawer mode switch is placed to TEST, it is out of OPERATE. This will provide a rod withdraw block.
d.	Incorrect - Fully withdrawing the IRM will not bypass the IRM rod withdraw block

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	GP-2, Appendix 1		
Learning Objective:	LLOT0250.8		
Knowledge/Ability:	215003 A4.05	Importance:	3.4/3.4
(Description of K&A, from catalog)			
Ability to manually operate and/or monitor in the control room: Trip bypasses			

Prepared by: Craig Fritz

Question: 14

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A unit 2 plant startup is in progress per GP-2 with the following conditions:

- Reactor Mode Switch in STARTUP
- All IRMs on range 10
- APRM #1 13.2%
- APRM #2 12.3%
- APRM #3 11.5%
- APRM #4 11.8%

WHICH ONE of the following describes the status of RPS and RDCS for the conditions above?

	<u>Status of RPS</u>	<u>Status of RDCS</u>
a.	Half Scram	No rod block
b.	Half Scram	Withdraw rod block
c.	No Scram	No rod block
d.	No Scram	Withdraw rod block

Answer Key and Question Data

Question # 14

Choice	Basis or Justification
a.	Incorrect – See “d” justification
b.	Incorrect – See “d” justification
c.	Incorrect – See “d” justification
d.	Correct Answer – Withdrawal Rod block only generated at 12%-13% Rx power with mode switch not in Run for at least 1 APRM in trip. Rx scram at 15%-20% with mode switch not in Run for at least 2 APRM's in trip.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	Tech Spec 2.2.1, GP-2		
Learning Objective:	LLOT275.14, 15		
Knowledge/Ability:	215005 A1.04	Importance:	4.1/4.1
(Description of K&A, from catalog) Ability to predict and/or monitor changes in parameters associated with operating the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM controls including: SCRAM and rod block trip setpoints			

Prepared by: Tim Kan

Question: 15

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Unit 2 plant conditions are as follows:

- "2A" Reactor Recirculation pump has tripped
- The CRS has entered the procedure for loss of a Reactor Recirculation Pump
- The RO is manually inserting control rods using the "INSERT" pushbutton to reduce power

MCR annunciator 108 REACTOR window F-4 "ROD DRIFT" has alarmed.

WHICH ONE of the following describes the cause of this alarm and whether it is an expected or an abnormal condition?

	<u>Cause of the Alarm</u>	<u>Expected or Abnormal</u>
a.	Any odd reed switch closed with no rod motion signal	Expected
b.	Any even reed switch closed with no rod motion signal	Expected
c.	Any odd reed switch closed with no rod motion signal	Abnormal
d.	Any even reed switch closed with no rod motion signal	Abnormal

Answer Key and Question Data

Question # 15

Choice	Basis or Justification
a.	Incorrect – It is not expected to get this alarm when using the NOTCH INSERT pushbutton. This alarm would not be abnormal if using the CONTINUOUS INSERT pushbutton.
b.	Incorrect – Only an odd reed switch made up with no rod motion signal will cause a rod drift alarm. It is not expected to get this alarm when using the NOTCH INSERT pushbutton. This alarm would not be abnormal if using the CONTINUOUS INSERT pushbutton.
c.	Correct Answer – A rod drift alarm occurs when an odd reed switch is closed with no rod motion signal. It is unexpected to get this alarm when using the NOTCH INSERT pushbutton.
d.	Incorrect – Only an odd reed switch made up with no rod motion signal will cause a rod drift alarm.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation			
Source:	New Exam Item		
Reference(s):	MCR ARC 108 REACTOR, window F-4		
Learning Objective:	LLOT0080.04		
Knowledge/Ability:	201002 K4.03	Importance:	3.6/3.6
(Description of K&A, from catalog) Knowledge of REACTOR MANUAL CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: Detection of drifting control rods			

Prepared by: Craig Fritz

Question: 16

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Unit 1 Division 1 DC power is lost due to an electrical fault.

WHICH ONE of the following activities CANNOT be performed?

- a. Start "1A" CRD pump
- b. Manually initiate RCIC
- c. Initiate ADS from the MCR
- d. Start "0A" Control Enclosure chiller

Answer Key and Question Data

Question # 16

Choice	Basis or Justification
a.	Incorrect – 1A CRD pump is powered from D13, and does not use Division 1 DC power.
b.	Correct Answer – RCIC cannot be started without Division 1 DC power to the governor circuit.
c.	Incorrect – While each of the five ADS valves have a solenoid powered by Division 1 DC, ADS can still be initiated from the MCR using Division 3 DC, and the Division 3 arm and depress pushbuttons.
d.	Incorrect - 0A Control Enclosure Chiller control power is from Division 3 DC, and is not affected by a loss of Division 1 DC.

Required Attachments or Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation

Source:	New Exam Item		
Reference(s):			
Learning Objective:	LLOT0380.12		
Knowledge/Ability:	217000 K2.02	Importance: 2.8/2.9	
(Description of K&A, from catalog)			
Knowledge of electrical power supplies to the following: RCIC initiation signals (logic)			

Prepared by: Craig Fritz

Question: 17

17 of 100

Unit 1 plant conditions are as follows:

- An automatic reactor scram has just occurred from 100% power due to high drywell pressure
- Both RPS channels (A and B) have de-energized, and all rods fully inserted
- All feedwater level components are in "AUTO" mode
- All feedwater instrumentation is functioning properly
- FWLC is in single element control with three element control available

WHICH ONE of the following describes the RPV level response during the first 10 seconds after the scram, and the reason for this response?

- a. RPV level will initially rise due to Scram Profile activation and core void collapse
- b. RPV level will initially rise due to Scram Profile NOT activating and more core inlet subcooling
- c. RPV level will initially lower due to Scram Profile activation and core void collapse
- d. RPV level will initially lower due to Scram Profile NOT activating and more core inlet subcooling

Answer Key and Question Data

Question # 17

Choice	Basis or Justification
a.	Incorrect - RPV level will not rise, as core void collapse will result in water from the downcomer region going into the core region to make up for the reduction in volume of the steam.
b.	Incorrect – RPV level will not rise, as core void collapse will result in water from the downcomer region going into the core region to make up for the reduction in volume of the steam. Scram Profile will activate since both RPS channels de-energized.
c.	Correct Answer – RPV level lowers due to void collapse and Scram Profile activation, which will reduce feedwater flow after the first 5 seconds after both RPS channels de-energize.
d.	Incorrect – Scram Profile will activate since both RPS channels de-energized, and the level reduction results from core voids collapsing, requiring water from the downcomer to replace the lost volume of the steam voids in the core.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	S06.1.D		
Learning Objective:	LLOR0401B.06		
Knowledge/Ability:	295006 AK3.01	Importance: 3.8/3.9	
(Description of K&A, from catalog)			
Knowledge of the reasons for the following responses as they apply to SCRAM: Reactor water level response			

Prepared by: Craig Fritz

Question: 18

18 of 100

Unit 2 plant conditions are as follows:

- An ATWS is in progress with reactor power 40%
- Main turbine is tripped
- RPV pressure is being maintained 990-1096 psig with SRVs
- Suppression Pool temperature 110°F and rising
- Suppression Pool water level 26 feet and steady
- Suppression Pool pressure 2.8 psig and rising slowly
- Drywell pressure 2.3 psig and rising slowly

The CRS directs initiation of SLC.

WHICH ONE of the following describes the reason for this action?

- a. Prevent exceeding SRV Tailpipe Level Limit
- b. Prevent exceeding Primary Containment Pressure Limit
- c. Prevent exceeding Pressure Suppression Pressure Limit
- d. Prevent exceeding Suppression Pool Heat Capacity Temperature Limit

Answer Key and Question Data

Question # 18

Choice	Basis or Justification
a.	Incorrect – see “d” justification
b.	Incorrect – see “d” justification
c.	Incorrect – see “d” justification
d.	Correct Answer – Per T-101 injecting SLC before Suppression Pool temperature reaches 110 degrees F is desirable to prevent exceeding the Heat Capacity Temperature Limit.

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	T-101, T-102		
Learning Objective:	LLOT1560.5		
Knowledge/Ability:	295013.K3.02	Importance:	3.6/3.8
(Description of K&A, from catalog) Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL TEMPERATURE: Limiting heat additions			

Prepared by: Tim Kan

Question: 19

19 of 100

Unit 2 plant conditions are as follows:

- OPCON 5 with Reactor Level 495 inches
- "2B" RHR loop is operating in Shutdown Cooling mode
- Normal 4KV Bus lineup

The 101 Safeguard Transformer Breaker trips and ALL automatic actions occur as designed. No operator action has been taken.

WHICH ONE of the following identifies the status of the "2B" RHR Pump and the "B RHR Shutdown Clg Injection PCIV" (OUTBOARD), HV-51-2F015B, two (2) minutes following the trip of the 101 Safeguard Transformer Breaker?

	<u>"2B" RHR Pump</u>	<u>HV-51-2F015B</u>
a.	Tripped	Closed
b.	Tripped	Open
c.	Running	Closed
d.	Running	Open

Answer Key and Question Data

Question # 19	
Choice	Basis or Justification
a.	Incorrect - With "B loop of Shutdown Cooling in service, HV-51-2F015B will be open. Since the valve does not receive an isolation signal on a loss of the 101 Safeguard Bus, the valve will remain open.
b.	Correct Answer - "2B" RHR Pump will trip on undervoltage due to temporary loss of power to D22 which is normally powered from the 101 Safeguard Bus. The "2B" RHR Pump will not auto restart. HV-51-2F015B will remain open since there is no isolation signal for the valve.
c.	Incorrect - See "b"
d.	Incorrect - See "b"

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	E-D22, Load Analysis	
Learning Objective:	LLOT0370.14	
Knowledge/Ability:	205000 K6.01	Importance: 3.3/3.4
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the following will have on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE): A.C. electrical power.		

Prepared by: Lee Stanford

Question: 20

20 of 100

Unit 1 plant conditions are as follows:

- #2 APRM has an INOP trip condition
- All other APRMs are functioning normally

WHICH ONE of the following describes the effect of the APRM failure on the "1A" and "1B" Rod Block Monitor (RBM)?

	<u>Effect on "1A" RBM</u>	<u>Effect on "1B" RBM</u>
a.	No effect	First alternate APRM lost
b.	First alternate APRM lost	First alternate APRM lost
c.	No effect	Primary reference APRM lost
d.	First alternate APRM lost	Primary reference APRM lost

Answer Key and Question Data

Question # 20

Choice	Basis or Justification
a.	Incorrect – see justification for c.
b.	Incorrect – see justification for c.
c.	Correct Answer – #2 APRM is the primary reference APRM for the "1B" RBM channel. It is not used at all by the "1A" RBM.
d.	Incorrect – see justification for c.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):		
Learning Objective:	LLOT0280.09	
Knowledge/Ability:	215002 K5.01	Importance: 2.6/2.8
(Description of K&A, from catalog)		
Knowledge of the operational implications of the following concepts as they apply to ROD BLOCK MONITOR: Trip reference selection		

Prepared by: Craig Fritz

Question: 21

21 of 100

Unit 1 plant conditions are as follows:

- 100% power
- Division 3 DC bus de-energized due to ground fault
- "1A" CRD Pump is in service
- No ECCS pumps are in service

A LOCA occurs which results in reactor level lowering to -150". No operator action has been taken other than normal scram actions.

WHICH ONE of the following pumps will be running following the LOCA?

- a. "1A" CRD
- b. "1C" RHR
- c. "0A" RHRSW
- d. "1C" Core Spray

Answer Key and Question Data	
Question # <u>21</u>	
Choice	Basis or Justification
a.	Correct Answer - If 1A CRD Pump is running prior to LOCA signal, breaker cannot trip on LOCA signal due to breaker control power unavailable.
b.	Incorrect - "1C" RHR Pump logic and breaker control power unavailable due to loss of Div. 3 DC.
c.	Incorrect - "0A" RHRSW Pump breaker control power is from Div. 1 DC. Pump breaker will trip on LOCA and does not auto restart.
d.	Incorrect - "1C" Core Spray Pump logic and breaker control power unavailable due to loss of Div. 3 DC.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation			
Source:	New Exam Item		
Reference(s):	E-1FC		
Learning Objective:	LLOT0690.6b		
Knowledge/Ability:	295004 AK2.03	Importance:	3.3/3.3
(Description of K&A, from catalog)			
Knowledge of the interrelations between partial or complete loss of DC Power and the following: DC bus loads.			

Prepared by: Lee Stanford

Question: 22

22 of 100

Unit 1 plant conditions are as follows:

- A fire has occurred in the MCR
- The MCR has been abandoned
- All appropriate actions have been taken in SE-1, "Remote Shutdown"
- RPV pressure has been reduced to 50 psig
- RPV level at the Remote Shutdown Panel indicates +40 inches

WHICH ONE of the following describes the available level instrumentation at the Remote Shutdown Panel, and whether the instrument indicates higher or lower than actual level in the given condition?

- a. Wide Range; indicates higher than actual level
- b. Wide Range; indicates lower than actual level
- c. Shutdown Range; indicates higher than actual level
- d. Shutdown Range; indicates lower than actual level

Answer Key and Question Data

Question # 22

Choice	Basis or Justification
a.	Correct Answer – Only Wide Range is available at 10C201, and per SE-1 caution above step 4.8.1, it will read higher than actual during cooldown.
b.	Incorrect – See justification for a.
c.	Incorrect – See justification for a.
d.	Incorrect – See justification for a.

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	SE-1	
Learning Objective:	LLOT0050.03	
Knowledge/Ability:	295016 AA2.02	Importance: 4.2/4.3
(Description of K&A, from catalog)		
Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT: Reactor water level		

Prepared by: Craig Fritz

Question: 23

23 of 100

Unit 2 plant conditions are as follows:

- 100% power
- "2A" RECW pump is running with its handswitch in "AUTO"
- "2B" RECW pump is not running with its handswitch in "AUTO"

WHICH ONE of the following conditions will result in the auto start of the "2B" RECW pump?

- a. RECW pump suction pressure is 16 psig
- b. RECW heat exchanger outlet pressure is 112 psig
- c. RECW heat exchanger inlet temperature is 118 deg. F
- d. RECW heat exchanger outlet temperature is 124 deg. F

Answer Key and Question Data	
Question # <u>23</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – The only condition that will cause an auto start of an RECW pump is low RECW heat exchanger outlet pressure of < 118.6 psig with no LOCA signal present and the handswitch in AUTO. Therefore, "b" is correct since it provides an outlet pressure of 112 psig.
c.	Incorrect – See justification for b.
d.	Incorrect – See justification for b..

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation	
Source:	New Exam Item
Reference(s):	ARC for 118 SERVICES, H-3
Learning Objective:	LLOT0460.4
Knowledge/Ability:	400000 K4.01
Importance: 3.4/3.9	
(Description of K&A, from catalog)	
Knowledge of CCWS design feature(s) and or interlocks which provide for the following:	
Automatic start of standby pump	

Prepared by: Craig Fritz

Question: 24

24 of 100

Unit 1 is at 100% reactor power

LISL-42-1N680C, "Reactor Level 3 Level Switch" has failed downscale, causing the following alarm:

107 REACTOR, H-1, "REACTOR WATER BELOW LEVEL 3 TRIP"

WHICH ONE of the following identifies the expected indication of the Scram Status lights and the position of the Scram Discharge Volume Vent and Drain Valves?

	<u>Scram Status Lights</u>	<u>SDV Vent and Drain Valve Positions</u>
a.	"A" Status Lights out	One Vent and One Drain Valve Closed
b.	"A" Status Lights out	No Vent or Drain Valves Closed
c.	"B" Status Lights out	One Vent and One Drain Valve Closed
d.	"B" Status Lights out	No Vent or Drain Valves Closed

Answer Key and Question Data	
Question # <u>24</u>	
Choice	Basis or Justification
a.	Incorrect - See "b"
b.	Correct Answer - The "C" Reactor Level trip unit failing downscale should provide a half scram on the "A" side which should extinguish the "A" RPS Scram Status lights. The Scram Discharge Volume Vent and Drains will only reposition on a full scram signal.
c.	Incorrect - See "b"
d.	Incorrect - See "b"

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	ARC-MCR-107 H-1, OT-117	
Learning Objective:	LLOT0300.3, 7	
Knowledge/Ability:	212000 A3.04	Importance: 3.9/3.8
(Description of K&A, from catalog) Ability to monitor automatic operation of the REACTOR PROTECTION SYSTEM including: System status lights and alarms.		

Prepared by: Lee Stanford

Question: 25

25 of 100

Unit 2 plant conditions are as follows:

- An ATWS is in progress, with power at 20% and stable
- The RRCS Manual Initiation pushbuttons have been armed and depressed
- Three minutes later, power is still at 20%
- All RRCS functions have occurred, except the "2B" SBLC pump failed to start

WHICH ONE of the following describes the status of the RWCU isolation valves?

	<u>HV-44-2F001 (INBOARD)</u>	<u>HV-44-2F004 (OUTBOARD)</u>
a.	Open	Open
b.	Open	Closed
c.	Closed	Open
d.	Closed	Closed

Answer Key and Question Data	
Question # <u>25</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for d.
b.	Incorrect – See justification for d.
c.	Incorrect – See justification for d.
d.	Correct Answer – RRCS will initiate an isolation of both the inboard and outboard RWCU isolation valves if RRCS pushbuttons are armed and depressed, power is above 3.2% (APRMs not downscale), and 118 second time delay times out. Both valves will receive an isolation signal directly from the RRCS logic, and it does not matter if the SBLC pumps actually start or not.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation			
Source:	New Exam Item		
Reference(s):	GE Elementary Drawing G31-1020		
Learning Objective:	LLOT0315.03		
Knowledge/Ability:	204000 K6.07	Importance:	3.3/3.5
(Description of K&A, from catalog)			
Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER CLEANUP SYSTEM: SBLC logic			

Prepared by: Craig Fritz

Question: 26

26 of 100

MCR HVAC alignment is as follows:

- "0A" CREFAS fan is operating due to a radiation isolation
- "0A" CREFAS fan control switch is in AUTO
- "0B" CREFAS fan control switch is in STBY

A valid chlorine isolation signal has just been generated.

WHICH ONE of the following describes the expected response of the CREFAS system?

- a. "0B" CREFAS fan starts immediately
- b. "0B" CREFAS fan starts in 30 seconds
- c. "0A" CREFAS fan trips, then restarts immediately
- d. "0A" CREFAS fan trips, then restarts in 30 seconds

Answer Key and Question Data

Question # 26

Choice	Basis or Justification
a.	Incorrect – "0B" CREFAS fan will only start if it is in AUTO, or if the "0A" CREFAS fan fails to start.
b.	Incorrect – "0B" CREFAS fan will only start if it is in AUTO, or if the "0A" CREFAS fan fails to start.
c.	Incorrect – "0A" CREFAS fan will trip, but will only restart after a 30 second time delay to allow time for HV78-020A(B,C,D) to close.
d.	Correct Answer – Chlorine isolation signal will cause "0A" CREFAS fan to trip and restart 30 seconds later.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	0	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):			
Learning Objective:	LLOT0450, Objective 04		
Knowledge/Ability:	290003 A3.01	Importance:	3.3/3.5
(Description of K&A, from catalog)			
Ability to monitor automatic operations of the CONTROL ROOM HVAC including:			
Initiation/reconfiguration			

Prepared by: Craig Fritz

Question: 27

27 of 100

Unit 2 initial plant conditions are as follows:

- 100% reactor power
- "2A" RWCU pump is not available

A loss of offsite power occurs at LGS. The Power System Director reports that due to significant storm damage, offsite power may not be restored for up to three (3) days.

The CRS has directed the PRO to supply ESW to the RECW and TECW heat exchangers.

WHICH ONE of the following describes the reasons for these actions?

	<u>Reason for Aligning ESW to RECW</u>	<u>Reason for Aligning ESW to TECW</u>
a.	Provide RECW to DWCW to cool the primary containment	To provide cooling to the Condensate Pump bearing oil coolers
b.	Keep RWCU in service to minimize bottom head stratification	To provide cooling to the Condensate Pump bearing oil coolers
c.	Provide RECW to DWCW to cool the primary containment	To provide cooling to Instrument Air compressors
d.	Keep RWCU in service to minimize bottom head stratification	To provide cooling to Instrument Air compressors

Answer Key and Question Data

Question # 27

Choice	Basis or Justification
a.	Incorrect – Condensate pumps are not safeguard powered, and will be unavailable during a LOOP.
b.	Incorrect – Condensate pumps are not safeguard powered, and will be unavailable during a LOOP. "2A" RWCU pump is inop. The other RWCU pumps ("2B" and "2C") are also not available, since they are not safeguard powered.
c.	Correct Answer – E10/20 provides guidance for performing S13.6.D to provide RECW cooling to DWCW for containment cooling. TECW can be used to cool the instrument air compressors (which are powered from safeguard power) to provide air for plant components.
d.	Incorrect – "2A" RWCU pump is inop. The other RWCU pumps ("2B" and "2C") are also not available, since they are not safeguard powered.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	E10/20, S13.6.D		
Learning Objective:	LLOT0430.07, LLOT0460.07,08		
Knowledge/Ability:	295018 AK3.07	Importance:	3.1/3.2
(Description of K&A, from catalog) Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Cross-connecting with backup systems			

Prepared by: Craig Fritz

Question: 28

28 of 100

Unit 2 plant conditions are as follows:

- Reactor startup in progress, with reactor power at 4%
- Reactor pressure is 960 psig
- Feedwater injection to the RPV is through Startup Bypass Valve LV-C-06-238A

An instrument air line break occurs that results in a loss of air to LV-C-06-238A only.

WHICH ONE of the following describes the response of LV-C-06-238A, and an alternative method for maintaining RPV level?

	<u>Response of LV-C-06-238A</u>	<u>Alternative Method for Maintaining RPV Level</u>
a.	Fails open	Close HV-06-238 and open HV-06-208A (A RFP Disch Valve)
b.	Fails open	Close HV-06-238 and open HV-06-220 (Pump Bypass Valve)
c.	Fails closed	Open HV-06-208A (A RFP Disch Valve)
d.	Fails closed	Open HV-06-220 (Pump Bypass Valve)

Answer Key and Question Data	
Question # 28	
Choice	Basis or Justification
a.	Incorrect – See justification for c.
b.	Incorrect – See justification for c.
c.	Correct Answer – LV-C-06-238A fails closed on a loss of air. Only HV-06-208A can pass enough water at 4% power to maintain RPV level, and water coming via the Pump Bypass line will be at condensate pump discharge pressure, and will not be high enough in pressure to inject to the vessel with RPV pressure of 960 psig.
d.	Incorrect – See justification for c.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	P&ID M-06	
Learning Objective:	LLOT0540.07, 14	
Knowledge/Ability:	295019 AK2.03	Importance: 3.2/3.3
(Description of K&A, from catalog) Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and the following: Reactor feedwater		

Prepared by: Craig Fritz

Question: 29

29 of 100

Unit 1 plant conditions are as follows:

- A LOCA has occurred
- RPV pressure is 60 psig and lowering slowly
- RPV level is -145 inches and steady
- Drywell temperature and pressure are on the safe side of T-102 Curve PC/P-2, Drywell Spray Initiation Limit
- Suppression pool level is 38.9 ft. and rising slowly.

WHICH ONE of the following describes the reason why drywell spray is not permitted in this condition?

- a. Adequate core cooling is not assured
- b. Suppression pool wall loading limits may be exceeded
- c. Suppression pool to drywell vacuum relief valves may not function
- d. Excessive negative drywell pressure may damage the drywell liner

Answer Key and Question Data

Question # 29

Choice	Basis or Justification
a.	Incorrect – Adequate core cooling is assured by core submergence above top of active fuel (>-161).
b.	Incorrect – Drywell spray does not contribute to suppression pool wall loading. This concern is a function of RPV pressure vs. suppression pool level, as determined by the SRV Tailpipe Level Limit Curve, SP/L-1.
c.	Correct Answer – Per T-102 Bases, step SP/L-22, with suppression pool level not able to be maintained below 38.7 ft. (elevation of the bottom of the internal suppression pool-to-drywell vacuum breakers less vacuum breaker opening pressure in feet of water), operation of the drywell sprays must be terminated because post drywell vacuum relief cannot be assured.
d.	Incorrect – Liner damage is likely to occur only if drywell spray is initiated with conditions on the unsafe side of the Drywell Spray Initiation Limit curve. The given conditions stated in the question are that conditions are on the safe side of this curve.

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):		
Learning Objective:	LLOT1560.5	
Knowledge/Ability:	295029 G2.1.32	Importance: 3.4/3.8
(Description of K&A, from catalog)		
High Suppression Pool Water Level: Ability to explain and apply system limits and precautions.		

Prepared by: Craig Fritz

Question: 30

30 of 100

Unit 2 plant conditions are as follows:

- A LOCA has occurred
- The Reactor is shutdown with all rods in
- Both H₂/O₂ Analyzers have been in service for the past hour
- DW O₂ level is 5%
- DW H₂ level is 1.5%
- SP H₂ level is 0.5%

WHICH ONE of the following describes the required actions for operating the H₂ Recombiners and primary containment requirements for the conditions above?

	<u>H₂ Recombiners</u>	<u>Primary Containment Requirements</u>
a.	Operate	Inert/Vent Drywell without exceeding General Emergency offsite release rate
b.	Operate	Inert/Vent Drywell regardless of offsite release
c.	Do not operate	Inert/Vent Drywell without exceeding General Emergency offsite release rate
d.	Do not operate	Inert/Vent Drywell regardless of offsite release

Answer Key and Question Data

Question # 30

Choice	Basis or Justification
a.	Correct Answer - Per T-102 sheet #2, table PC/G-1 entry into leg DW/G-2 is required for these H ₂ O ₂ levels. This requires operation of the H ₂ Recombiners and Venting of DW without exceeding offsite release rates.
b.	Incorrect – See “a” justification
c.	Incorrect – See “a” justification
d.	Incorrect – See “a” justification

Required Attachments or Reference	T-102 sheet #2
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation			
Source:	New Exam Item		
Reference(s):	T-102 sheet #2		
Learning Objective:	LLOT0160.2		
Knowledge/Ability:	500000 EK2.05	Importance:	3.2/3.3
(Description of K&A, from catalog) Knowledge of the interrelations between HIGH CONTAINMENT HYDROGEN CONCENTRATIONS and the following: Hydrogen and oxygen recombiners			

Prepared by: Tim Kan

Question: 31

31 of 100

Unit 1 plant conditions are as follows:

- Startup in progress, with all IRMs on Range 5
- SRM shorting links are installed
- As power has risen, all SRMs have been partially withdrawn to maintain count rate between 100 and 10^5 cps

The RO has just selected and fully withdrawn all four SRMs, and all SRM count rates are now less than 3 cps.

WHICH ONE of the following describes the status of the SRM system?

- a. SRM rod withdraw block enforced due to SRMs downscale
- b. SRM rod withdraw block will NOT enforce due to IRMs above Range 3
- c. SRM rod withdraw block will NOT enforce due to shorting links installed
- d. SRM rod withdraw block enforced due to detectors fully withdrawn when not permitted

Answer Key and Question Data	
Question # <u>31</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – With all IRMs above range 3, both the "SRM retracted when not permitted" and "SRM Downscale" rod blocks are bypassed. Therefore, no SRM rod withdraw block is enforced.
c.	Incorrect – shorting links are in the RPS circuit, and do not affect SRM rod withdraw blocks
d.	Incorrect – See justification for b.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):		
Learning Objective:	LLOT0240.6	
Knowledge/Ability:	215004 A1.04	Importance: 3.5/3.5
(Description of K&A, from catalog) Source Range Monitor System: Ability to predict and/or monitor changes in parameters associated with operating the SOURCE RANGE MONITOR (SRM) SYSTEM controls including: Control rod block status		

Prepared by: Craig Fritz

Question: 32

32 of 100

Entry into the Unit 2 "4A" Feedwater heater room is required with the following conditions:

- 2 Equipment Operators are required
- The first Equipment Operator has 150 mrem TEDE for the current year
- The second Equipment Operator has 300 mrem TEDE for the current year
- Both Equipment Operators will be working in a 600 mrem/hr field
- None of the Equipment Operators have a High Lifetime Exposure
- The job will take 3 hrs to complete

WHICH ONE of the following describes who gives dose extension approvals and if administrative dose control levels will be exceeded for the conditions above?

	<u>Dose Extension Approval</u>	<u>Administrative Dose Control Level Exceeded</u>
a.	RP Manager	No
b.	Station VP	Yes
c.	RP Manager	Yes
d.	Station VP	No

Answer Key and Question Data	
Question # 32	
Choice	Basis or Justification
a.	Incorrect – see “c” justification
b.	Incorrect – see “c” justification
c.	Correct Answer – Admin dose control levels are 2000 mrem per year. 3 hrs x 600 mrem/hr = 1800 mrem. #1EO 150 mrem + 1800 mrem = 1950 mrem. #2 EO 300 mrem + 1800 mrem = 2100 mrem. #2 EO may exceed Admin levels. RPM authorizes all dose extensions above Admin dose control levels.
d.	Incorrect – see “c” justification

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	RP-AA-203	
Learning Objective:	Exelon Generic lesson plan RWT 7,17,18	
Knowledge/Ability:	2.3.04	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: Tim Kan

Question: 33

33 of 100

Unit 2 plant conditions are as follows:

- A seismic event has occurred
- Reactor power 100%
- HPCI is operating in Full Flow Test from Suppression Pool to Suppression Pool
- Suppression Pool cooling is in service with "2A" RHR pump running
- Suppression Pool level 20 feet and lowering slowly

WHICH ONE of the following describes the required action of T-102 and the reason for the action?

- a. Secure HPCI if Suppression Pool level drops below 18 feet due to vortex limits
- b. Secure "2A" RHR pump if Suppression Pool level drops below 13.5 feet due to vortex limits
- c. Transfer HPCI suction to the CST if Suppression Pool level drops below 13.5 feet due to vortex limits
- d. Shutdown the reactor if Suppression Pool level drops below 13.5 feet due to Drywell and Suppression Pool being directly connected at 13 feet

Answer Key and Question Data

Question # 33

Choice	Basis or Justification
a.	Incorrect – Vortex limits for HPCI are at 15.42 ft in SP. HPCI must be shutdown at 18 ft in SP to prevent pressurizing SP air space due to HPCI exhaust.
b.	Correct Answer – RHR vortex limits set at 13.42 ft in SP requires shutdown of pump.
c.	Incorrect – HPCI must be shutdown at 18 ft in SP to prevent pressurizing SP air space due to HPCI exhaust regardless of core cooling.
d.	Incorrect – Plant is not shutdown until 12 ft in SP. At 13 ft in SP and DW are not cross-connected.

Required Attachments or Reference	T-102
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-102 and T-102 Bases	
Learning Objective:	LLOT1560.5	
Knowledge/Ability:	219000 K6.06	Importance: 3.7/3.7
(Description of K&A, from catalog)		
Knowledge of the effects that a loss or malfunction of the following will have on the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE: Suppression pool		

Prepared by: Tim Kan

Question: 34

34 of 100

Unit 1 plant conditions are as follows:

- Reactor scrammed from 100% due to High Drywell Pressure
- GP-4 was NOT performed
- Drywell pressure is 25 psig and rising
- Drywell temperature is 260°F and rising
- Reactor pressure is 500 psig and dropping
- Reactor level is +35 inches

The CRS directs the PRO to spray the Drywell per T-225, Startup and Shutdown of Suppression Pool and Drywell Spray Operation, using "1A" RHR.

WHICH ONE of the following actions must be taken before Drywell Spray can be initiated?

- a. Trip both Recirc Pumps
- b. Place "0A" RHRSW in service
- c. Close HV-51-1F017A, 1A RHR LPCI Inj PCIV
- d. Arm and Depress E11A-S61A, INITIATION Pushbutton

Answer Key and Question Data	
Question # <u>34</u>	
Choice	Basis or Justification
a.	Incorrect - Following a reactor scram, a Main Generator Lockout will occur on Reverse Power. The Generator Lockout will initiate a Fast Transfer on the Unit Aux Buses which will cause both Recirc Pumps to trip automatically.
b.	Incorrect - RHRSW is placed in service after Drywell Spray has been initiated per T-225.
c.	Incorrect - HV-51-1F017A, LPCI Valve will not open until a valid LOCA occurs on Reactor Level of -129" or 1.68 psig Drywell Pressure and < 455 psig Reactor Pressure, which has not been reached. The valve will still be closed.
d.	Correct Answer - Per T-225, if a LOCA signal does not exist, the PRO must manually initiate a Divisional LOCA in order to open the Drywell Spray valves. Since pressure is above 455 psig, the PRO must arm and depress E11A-S61A, INITIATION Pushbutton.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-225	
Learning Objective:	LLOT0370.09	
Knowledge/Ability:	226001 G1.20	Importance: 4.3/4.2
(Description of K&A, from catalog)		
Ability to execute procedure steps: RHR/LPCI: Containment Spray Mode		

Prepared by: Lee Stanford

Question: 35

35 of 100

Unit 1 initial plant conditions are as follows:

- Reactor power is 100%
- Reactor level is +35 inches
- RPV steam dome pressure is 1035 psig

WHICH ONE of the following describes a condition that will violate a Technical Specification Safety Limit?

- a. Drywell pressure rises to 60 psig
- b. Reactor level drops to –170 inches
- c. Reactor pressure rises to 1280 psig
- d. Minimum Critical Power Ratio (MCPR) lowers to 1.12

Answer Key and Question Data

Question # 35

Choice	Basis or Justification
a.	Incorrect – DW pressure at 60 psig exceeds the design limits of the containment, but is not a safety limit, as it will not damage the fuel cladding, reactor pressure vessel, or primary system piping.
b.	Correct Answer – RPV level below –161 inches violates Safety Limit 2.1.4. This Safety Limit is only applicable in OPCIION 3, 4, and 5. While the plant is starting in OPCIION 1, when the reactor scrams at +12.5 inches, the plant will then be in OPCIION 3, and this Safety Limit applies.
c.	Incorrect – RPV pressure must rise above 1325 psig to exceed safety limit 2.1.3.
d.	Incorrect – MCPR must lower below 1.07 with 2 recirc pumps in operation to exceed safety limit 2.1.2.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation

Source:	New Exam Item		
Reference(s):	Technical Specifications section 2.2		
Learning Objective:	LLOT1800.04		
Knowledge/Ability:	Generic 2.2.22	Importance:	3.4/4.1
(Description of K&A, from catalog)			
Knowledge of limiting conditions for operations and safety limits			

Prepared by: Craig Fritz

Question: 36

36 of 100

Unit 2 plant conditions are as follows:

- OPCON 2
- Reactor power is 8%
- Control rod 22-11 is at position 10 and is being withdrawn to its withdrawal limit of 12

An inadvertent two-notch withdrawal results in control rod 22-11 stopping at position 14. Supervision and Reactor Engineering have been notified.

WHICH ONE of the following describes the required action(s) per ON-123, Mispositioned Control Rod(s)?

- a. Immediately insert a manual reactor Scram
- b. Substitute a rod position of 12 and insert rod 1 notch
- c. Bypass the Rod Worth Minimizer and insert to position 12
- d. Insert control rod to position 12 using the "INSERT" pushbutton

Answer Key and Question Data

Question # 36

Choice	Basis or Justification
a.	Incorrect – see “d” justification
b.	Incorrect – see “d” justification
c.	Incorrect – see “d” justification
d.	Correct Answer – One notch withdrawal error is allowed to be corrected by inserting control rod back to its target position.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	ON-123		
Learning Objective:	LLOT0095.3		
Knowledge/Ability:	G2.2.33	Importance:	2.5/2.9
(Description of K&A, from catalog) Knowledge of control rod programming			

Prepared by: Mark Crim

Question: 37

37 of 100

Unit 1 plant conditions are as follows:

- Plant in OPCON 4
- Shutdown cooling placed in service using "1A" RHR loop 30 minutes ago
- Reactor level +80 inches on Upset Range
- Average Reactor coolant temperature 195 degrees F and stable

Rx level drops to +10 inches on Narrow Range and stabilizes.

WHICH ONE of the following describes allowable actions that will permit restoration of Shutdown Cooling and the reason for the actions?

	<u>Actions that will Allow Restoration of Shutdown Cooling</u>	<u>Reason for Actions</u>
a.	Restore Reactor level to +35 inches and bypass low level isolations per GP-8.5, "Isolation Bypass of Crucial Systems"	Prevent inadvertent change of OPCON
b.	Restore Reactor level to +35 inches and bypass low level isolations per GP-8.5, "Isolation Bypass of Crucial Systems"	Ensure adequate NPSH for the "1A" RHR pump
c.	Restore Reactor level to +80 inches and reset low level isolations	Prevent inadvertent change of OPCON
d.	Restore Reactor level to +80 inches and reset low level isolations	Ensure adequate NPSH for the "1A" RHR pump

Answer Key and Question Data

Question # 37

Choice	Basis or Justification
a.	Incorrect – GP-8.5 does not address isolation bypass of Shutdown Cooling isolations
b.	Incorrect – GP-8.5 does not address isolation bypass of Shutdown Cooling isolations, raising level is not to satisfy RHR pump NPSH concerns
c.	Correct Answer – Must restore level >12.5" and then reset the low level isolation to reopen valves. If not restored decay heat will cause RPV temp to rise and cause and inadvertent change of OPCIION from OPCIION 4 to 3.
d.	Incorrect – Raising level is not to satisfy RHR pump NPSH concerns.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation

Source:	New Exam Item		
Reference(s):	S51.8.B, OT-121		
Learning Objective:	LLOT0370.13		
Knowledge/Ability:	295021 K1.01	Importance:	3.6/3.8
(Description of K&A, from catalog) Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING: Decay heat			

Prepared by: Tim Kan

Question: 38

38 of 100

Unit 1 plant conditions are as follows:

- OPCON 5
- A fuel bundle is currently being lowered into the core, not directly adjacent to any SRM

WHICH ONE of the following responses requires entry into ON-120, Fuel Handling Problems?

- a. "A" SRM rises from 30 to 100 cps
- b. "B" SRM rises from 45 to 130 cps
- c. "C" SRM rises from 35 to 150 cps
- d. "D" SRM rises from 50 to 170 cps

Answer Key and Question Data

Question # 38

Choice	Basis or Justification
a.	Incorrect - since two doublings not reached
b.	Incorrect - since two doublings not reached
c.	Correct Answer - Per ON-120, symptom 1.1, with C SRM rising from 35 to 150 cps, it has increased by more than two doublings, and ON-120 must be entered.
d.	Incorrect - since two doublings not reached

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	ON-120		
Learning Objective:	LLOT1550.1		
Knowledge/Ability:	295023 AA1.06	Importance: 3.3/3.4	
(Description of K&A, from catalog)			
Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS:			
Neutron monitoring			

Prepared by: Craig Fritz

Question: 39

39 of 100

Unit 1 is at 100% power.

The RO manually scrams the reactor due to rising Drywell Pressure. The following indications are observed:

- All Scram Status lights are extinguished
- PMS indicates "ALL RODS IN"
- SCRAM PROFILE light is lit
- Reactor Level drops to -30" before recovering

WHICH ONE of the following identifies the RPV level at which Setpoint Setdown will be activated and the mode of RPV level control when Setpoint Setdown is activated?

- a. Less than +12.5" lowering, Single Element Control
- b. Less than +12.5" lowering, Three Element Control
- c. Greater than +20 " rising, Single Element Control
- d. Greater than +20" rising, Three Element Control

Answer Key and Question Data	
Question # <u>39</u>	
Choice	Basis or Justification
a.	Incorrect - See "c"
b.	Incorrect - See "c"
c.	Correct Answer - On a valid scram (A and B RPS de-energize), FWLC holds pre-scram FW flowrate for 5 seconds and then ramps to 10% flow at 6% per second. When level restores above +20", FWLC transfers to single element, SCRAM PROFILE light extinguishes and Setpoint Setdown activates.
d.	Incorrect - See "c"

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	S0.6.1.D U/1	
Learning Objective:	LLOR0401B.6	
Knowledge/Ability:	259002 A3.06	Importance: 3.0/3.0
(Description of K&A, from catalog) Ability to monitor automatic operations of the REACTOR WATER LEVEL CONTROL SYSTEM including: Reactor water level setpoint setdown following a reactor scram.		

Prepared by: Lee Stanford

Question: 40

40 of 100

Unit 2 plant conditions are as follows:

- OPCON 5
- Irradiated fuel moves are in progress
- Secondary Containment Zones 2 and 3 are NOT cross-tied
- Secondary Containment ventilation controls are in a normal alignment

The following indications and alarms exist in the MCR:

- Annunciator 209 RAD, E-1 "1 REAC ENCL REFUEL FLR VENT EXHAUST RAD MON A/B HI-HI/DOWNSCALE"
- Annunciator 209 RAD, E-3 "1 REAC ENCL REFUEL FLR VENT EXHAUST HI RADIATION"
- Refuel Floor ventilation exhaust radiation indicates 2.5 mr/hr
- Reactor Enclosure ventilation exhaust radiation indicates 0.8 mr/hr

No operator actions have been taken.

WHICH ONE of the following describes the response of SGTS fans and RERS fans to the conditions above?

	<u>SGTS Fans</u>	<u>RERS Fans</u>
a.	One Fan running	No Fans running
b.	Both Fans running	One Fan running
c.	One Fan running	One Fan running
d.	Both Fans running	No Fans running

Answer Key and Question Data	
Question # <u>40</u>	
Choice	Basis or Justification
a.	Incorrect – see “d” justification
b.	Incorrect – see “d” justification
c.	Incorrect – see “d” justification
d.	Correct Answer – On a RF exhaust ventilation HI-HI RAD both SGTS fans start. RERS fan auto starts ONLY on RE exhaust ventilation HI-HI RAD.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	Annun 209 E-1, E-3	
Learning Objective:	LLOT0200.6	
Knowledge/Ability:	261000 K1.08	Importance: 2.8/3.1
(Description of K&A, from catalog)		
Knowledge of the physical connections and/or cause-effect relationships between STANDBY GAS TREATMENT SYSTEM and the following: Process radiation monitoring system.		

Prepared by: Tim Kan

Question: 41

41 of 100

ATTACHMENT Q41 IS PROVIDED

Unit 2 plant conditions are as follows:

- Reactor power is 50%
- EHC Load Set is adjusted to 55%
- EHC Load Limit is set at 103%
- Maximum Combined Flow Limit is set at 115%
- EHC pressure setpoint is set at 960 psig
- 3 psi bias is applied to the "B" pressure regulator
- Main Steam pressure at the Pressure Averaging Manifold (PAM) is 974 psig
- Turbine Control Valves are open for 47% steam flow

Reactor power is raised and Main Steam PAM pressure rises to 984 psig. No other manual adjustments have been made.

WHICH ONE of the following describes the expected total control valve position (in % open) after the plant is stabilized?

- a. 45%
- b. 55%
- c. 80%
- d. 103%

Answer Key and Question Data	
Question # <u>41</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – PAM pressure of 984 psig, with Pressure Setpoint of 960, results in a difference out of the regulator of 24 psig. $24 \text{ psig} \times 3.33\% \text{ (gain unit)} =$ approximately 80%. However, since Load Set is still set at 55%, total control valve open position is limited to 55%.
c.	Incorrect – See justification for b.
d.	Incorrect – See justification for b.

Required Attachments or Reference	EHC logic diagram
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):		
Learning Objective:	LLOT0590.05	
Knowledge/Ability:	241000 A1.08	Importance: 3.3/3.2
(Description of K&A, from catalog) Ability to predict and/or monitor changes in parameters associated with operating the REACTOR/TURBINE PRESSURE REGULATING SYSTEM controls including: control/governor valve position		

Prepared by: Craig Fritz

Question: 42

42 of 100

Unit 2 plant conditions are as follows:

- 100% reactor power
- +35" Reactor level
- Master Feedwater Level controller in "AUTO"
- All Reactor Feed Pump controllers in "AUTO"
- Feedwater Level Control is selected to "3 ELEMENT"

"C" Main Steam Line flow instrument fails upscale.

WHICH ONE of the following identifies the response of reactor water level and the procedural action required to mitigate this response?

- a. Reactor Level drops and stabilizes at a level above the scram setpoint. Place Feedwater Level control in Single Element Control per S06.0.E, U/2 Feedwater Level Control and Reactor Feed Pump Control System Manipulation.
- b. Reactor Level drops until scram occurs on Reactor Low Level. Restore Reactor Level using S06.1.D, U/2 Post Scram Level Control.
- c. Reactor Level rises and stabilizes at a level below Main Turbine trip setpoint. Manually control Reactor Feed Pumps in accordance with OT-110, Reactor High Level.
- d. Reactor Level rises until Main Turbine trip occurs on Reactor High Level. Restore Reactor Level using S06.1.D, U/2 Post Scram Level Control.

Answer Key and Question Data

Question # 42

Choice	Basis or Justification
a.	Incorrect - FWLCS will adjust feedwater flow higher to compensate for a false high steam flow signal, therefore reactor level will rise.
b.	Incorrect - See "a"
c.	Correct Answer - Feedwater flow will rise in response to the false high steam flow signal and level will stabilize at a higher reactor level. OT-110 directs manually controlling RFP if FWLCS malfunction occurs.
d.	Incorrect - See "c"

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	OT-110, REACTOR HIGH LEVEL		
Learning Objective:	LLOT0550.7		
Knowledge/Ability:	259001 A2.07	Importance: 3.7/3.8	
(Description of K&A, from catalog)			
Ability to (a) predict the impacts of the following on the REACTOR FEEDWATER SYSTEM; and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Reactor water level control system malfunctions			

Prepared by: Lee Stanford

Question: 43

43 of 100

Unit 1 plant conditions are as follows:

- Reactor power is 100%
- Annunciator 109 RAD, G-2, "1 Air Ejector Offgas Discharge Hi Radiation" is alarming
- Air Ejector Discharge radiation level is 4.1×10^5 mr/hr and rising slowly

WHICH ONE of the following actions is required to reduce Air Ejector discharge radiation levels below 2.1×10^4 mr/hr and the reason for lowering Air Ejector discharge radiation levels?

	<u>Actions Required to Reduce Air Ejector Radiation Levels</u>	<u>Reason for Lowering Air Ejector Discharge Radiation Levels</u>
a.	Reduce Reactor Power	Limit Off Site release through the North Stack
b.	Reduce Reactor Power	Limit Off Site release through the South Stack
c.	Isolate Steam Jet Air Ejectors	Limit Off Site release through the North Stack
d.	Isolate Steam Jet Air Ejectors	Limit Off Site release through the South Stack

Answer Key and Question Data

Question # 43

Choice	Basis or Justification
a.	Correct Answer – Per ON-102 basis, reduction of power result in acceptable short term off-gas releases after a delay in the charcoal absorbers. Off gas discharges to the North Stack.
b.	Incorrect – Off gas does not discharge to the South Stack
c.	Incorrect – While isolating SJAE would lower radiation levels, it is not a required action and eventual loss of condenser vacuum would result.
d.	Incorrect – While isolating SJAE would lower radiation levels, it is not a required action and eventual loss of condenser vacuum would result.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	ON-102		
Learning Objective:	LLOT1550.2		
Knowledge/Ability:	G2.3.11	Importance:	2.7/3.2
(Description of K&A, from catalog) Ability to control radiation releases.			

Prepared by: Tim Kan

Question: 44

44 of 100

Unit 1 plant conditions are as follows:

- Drywell Pressure 57 psig and rising
- Drywell Temperature 330°F and rising
- Reactor Level -175 inches and lowering
- Five (5) ADS Valves are open
- All ECCS pumps are running
- All rods are in

WHICH ONE of the following safety functions is the highest priority and the basis for the priority?

	<u>Highest Priority</u>	<u>Basis for Priority</u>
a.	Drywell Spray	Containment cooling is a higher priority than RPV integrity with the given conditions
b.	Drywell Spray	RPV integrity is not threatened with the given conditions
c.	Maximize RPV injection	Adequate core cooling is required before containment cooling is permitted with the given conditions
d.	Maximize RPV injection	Containment integrity is not threatened with the given conditions

Answer Key and Question Data	
Question # <u>44</u>	
Choice	Basis or Justification
a.	Incorrect - See justification for c.
b.	Incorrect - See justification for c.
c.	Correct Answer – At –175" reactor level, fuel is uncovered. T-111 directs maximizing RPV injection with all available systems when level drops below –161" and T-112 has been performed. This is a higher priority than drywell spray because T-102 only directs drywell sprays if adequate core cooling is assured.
d.	Incorrect - See justification for c.

Required Attachments or Reference	T-102, T-111
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation	
Source:	New Exam Item
Reference(s):	T-102 Bases, T-111 Bases
Learning Objective:	LLOT1560.05
Knowledge/Ability:	Generic 2.4.22
Importance: 3.0/4.0	
(Description of K&A, from catalog) Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.	

Prepared by: Lee Stanford

Question: 45

45 of 100

Unit 2 plant conditions are as follows:

- A large unisolable leak from the Reactor Recirculation System piping has resulted in a high drywell pressure condition
- Both suppression pool-to-drywell vacuum relief valves on one LOCA downcomer are stuck open
- Drywell and Suppression Pool sprays cannot be initiated
- Suppression Pool level is 24 ft. and rising very slowly

WHICH ONE of the following describes the expected response of the primary containment and the status of containment integrity?

- a. Drywell pressure will equalize with Suppression Pool pressure; containment integrity is NOT threatened
- b. Drywell pressure will equalize with Suppression Pool pressure; containment integrity is threatened
- c. Drywell pressure will rise to about 5 psig greater than Suppression Pool pressure; containment integrity is NOT threatened
- d. Drywell pressure will rise to about 5 psig greater than Suppression Pool pressure; containment integrity is threatened

Answer Key and Question Data

Question # 45

Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – With both vacuum reliefs on one LOCA downcomer stuck open, the suppression pool will be directly pressurized, which will cause pressures to equalize between the drywell and suppression pool. Also, the direct pressurization of the suppression pool removes the pressure suppression capability of the suppression pool, and with no containment sprays available, can result in drywell and/or suppression pool pressures exceeding design limits.
c.	Incorrect – See justification for b.
d.	Incorrect – See justification for b.

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation

Source:	New Exam Item		
Reference(s):	UFSAR section 3A.16.1		
Learning Objective:	LLOT0130.04		
Knowledge/Ability:	295024 EK1.01	Importance:	4.1/4.2
(Description of K&A, from catalog)			
Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: Drywell integrity			

Prepared by: Craig Fritz

Question: 46

46 of 100

Unit 2 plant conditions are as follows:

- The main turbine trips with core thermal power at 3458 MWth
- All main turbine bypass valves open following the turbine trip
- RPV pressure rises until several SRVs open at the high pressure relief setpoint
- A1, A2, A3, and A4 "SCRAM SYSTEM LOGIC" lights on 20C603 are lit

WHICH ONE of the following describes the plant response and the reason for this response?

	<u>Plant Response</u>	<u>Reason</u>
a.	ARI valves will open	To initiate rod insertion
b.	ARI valves will open	To prevent exceeding RPV design pressure
c.	Backup Scram valves will open	To initiate rod insertion
d.	Backup Scram valves will open	To prevent exceeding RPV design pressure

Answer Key and Question Data

Question # 46

Choice	Basis or Justification
a.	Correct Answer – All four of the "A" SCRAM SYSTEM LOGIC lights being lit indicate that RPS has not caused a scram on the turbine trip. Since both RPS systems (A and B) have not de-energized, the backup scram valves will not function. With SRVs lifting at their pressure relief setpoint (1170 minimum), RPV pressure exceeded 1149, and RRCS ARI will actuate. The UFSAR states that ARI is designed to "allow insertion of all control rods to begin within 15 seconds."
b.	Incorrect – SRVs are the components designed to prevent the RPV from exceeding design pressure.
c.	Incorrect – Both RPS systems have not de-energized ("A" still energized), therefore, backup scram valves will not open.
d.	Incorrect – Both RPS systems have not de-energized ("A" still energized), therefore, backup scram valves will not open. SRVs are the components designed to prevent the RPV from exceeding design pressure.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation

Source:	New Exam Item		
Reference(s):	UFSAR section 7.6.1.8.3.1		
Learning Objective:	LLOT0315.04		
Knowledge/Ability:	295025 EK3.06	Importance: 4.2/4.4	
(Description of K&A, from catalog)			
Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE: Alternate rod insertion			

Prepared by: Craig Fritz

Question: 47

47 of 100

Unit 1 plant conditions are as follows:

- 100% reactor power
- Normal reactor enclosure ventilation in service
- Both Standby Gas Treatment (SGTS) fans are in "AUTO"

A Drywell leak results in Drywell pressure rising to 3 psig. 5 minutes later, a lockout occurs on D12 4KV Bus.

WHICH ONE of the following identifies the status of the SGTS fans following the Bus Lockout?

- a. Both Fans off
- b. Both Fans running
- c. "A" Fan running, "B" Fan tripped
- d. "A" Fan tripped, "B" Fan running

Answer Key and Question Data	
Question # <u>47</u>	
Choice	Basis or Justification
a.	Incorrect - See justification for "c"
b.	Incorrect - See justification for "c"
c.	Correct Answer - Both SBGT Fans will start on Drywell pressure greater than 1.68 psig. The "B" SBGT Fan will trip on loss of power to D12.
d.	Incorrect - See justification for "c"

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	E-483	
Learning Objective:	LLOT0200.10	
Knowledge/Ability:	261000 k6.01	Importance: 2.9/3.0
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the following will have on the STANDBY GAS TREATMENT SYSTEM: A.C. electrical distribution		

Prepared by: Lee Stanford

Question: 48

48 of 100

Unit 2 plant conditions are as follows:

- OPCON 5
- D24 Bus is de-energized for relay replacement work
- 20Y102 Distribution Panel is blocked to replace the main breaker

The Electrical Maintenance Supervisor requests various 480 VAC Motor Control Centers and 120 VAC Distribution Panels be blocked for electrical maintenance.

WHICH ONE of the following 480 VAC MCCs/120 VAC Distribution Panels may be de-energized for maintenance?

- a. D214-R-C 480 VAC MCC
- b. D224-R-G 480 VAC MCC
- c. 20Y101 120 VAC Distribution Panel
- d. 20Y163 120 VAC Distribution Panel

Answer Key and Question Data

Question # 48

Choice	Basis or Justification
a.	Incorrect - This is a Division 1 MCC. In OPCON 5, 2 divisions are required to be energized. With D22 (due to loss of 20Y102) and D24 INOPERABLE, all Division 1 and 3 components must be energized per Tech Spec 3.8.3.2, ELECTRICAL POWER SYSTEMS DISTRIBUTION - SHUTDOWN
b.	Correct Answer - Division 2 is already INOPERABLE due to loss of 20Y102.
c.	Incorrect - 20Y101 is a Division 1 panel. See "a"
d.	Incorrect - 20Y163 is a Division 3 panel. See "a"

Required Attachments or Reference	Tech Specs
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Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	Tech Spec LCO 3.8.3.2		
Learning Objective:	LLOT0660.9		
Knowledge/Ability:	262001 G1.10	Importance: 2.7/3.9	
(Description of K&A, from catalog)			
Knowledge of conditions and limitations in the facility license: AC Electrical Distribution			

Prepared by: Lee Stanford

Question: 49

49 of 100

Unit 1 is at 100% reactor power when the following annunciator alarms:

- 1 MAIN STEAM LINE DIVISION I RAD MONITOR HI/DOWNSCALE

The following readings are taken from the Main Steam Line Rad Monitors on panel 10C600:

- A – 1310 mr/hr
- B – 1320 mr/hr
- C – 825 mr/hr
- D – 1340 mr/hr

The following information was obtained from the Unit 1 Main Steam Line Rad Monitors Operator Aid on panel 10C600:

Unit 1 Main Steam Line RAD Monitors

MSL Monitor	Background with HWC in-service	HWC Factor	1.5(x)HWC Factor of 1(x) Background =
1A	894 MR/hr	1.0	1341 MR/hr
1B	870 MR/hr	1.0	1305 MR/hr
1C	970 MR/hr	1.0	1455 MR/hr
1D	900 MR/hr	1.0	1350 MR/hr

WHICH ONE of the following identifies the Rad Monitor(s) responsible for the alarm?

- a. A
- b. B
- c. C
- d. D

Answer Key and Question Data

Question # 49

Choice	Basis or Justification
a.	Incorrect - Setpoint for A Rad Monitor is 1341 mr/hr.
b.	Correct Answer - Setpoint for B Rad Monitor is 1305 mr/hr and either A or B Rad Monitor will provide a DIV I alarm.
c.	Incorrect - Setpoint for C Rad Monitor is 1455 mr/hr and C Rad Monitor will provide a DIV II alarm. 825 mr/hr is mid range and will not provide a downscale alarm.
d.	Incorrect - Setpoint for D Rad Monitor is 1350 mr/hr and D Rad Monitor will provide a DIV II alarm.

Required Attachments or Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	ARC-MCR-109 F-1, Main Steam Line Rad Monitor Op Aid 01-014		
Learning Objective:	LLOT0720.02		
Knowledge/Ability:	272000 A4.01	Importance:	2.9/2.9
(Description of K&A, from catalog)			
Radiation Monitoring - Ability to manually operate and/or monitor in the control room: Recorder indications			

Prepared by: Lee Stanford

Question: 50

50 of 100

Unit 1 is at 100% reactor power when the following sequence of event occur:

- "C" Main Steam Line ruptures in the Outboard MSIV room and the steam line fails to isolate
- Outboard MSIV room pressure peaks at 5 psig
- Reactor scrams on MSIV closure
- Reactor level drops to -20 inches before recovering to +35 inches
- Drywell pressure is 0.4 psig
- Reactor Enclosure Ventilation Exhaust Radiation is 1.2 mr/hr

WHICH ONE of the following identifies the exhaust path(s) from the MSIV room?

- a. Standby Gas Treatment System to North Stack
- b. Reactor Enclosure Equipment Compartment Exhaust to South Stack
- c. Outboard MSIV room Blowout Panels to Reactor Building Roof and Condenser Area
- d. Reactor Enclosure Recirculation System to Standby Gas Treatment System to North Stack

Answer Key and Question Data

Question # 50

Choice	Basis or Justification
a.	Incorrect - Standby Gas Treatment System does not draw directly on the Outboard MSIV room, RERS would align to draw on the room and discharge to Standby Gas. See "d" for further explanation.
b.	Incorrect - This is the normal exhaust path for the Outboard MSIV room, however, due to the pressure rise in the room, the Steam Flooding Dampers will isolate to prevent the spread of steam throughout Secondary Containment.
c.	Correct Answer - A Main Steam Line break in the Outboard MSIV room will cause pressure in the room to rise which will cause the Steam Flooding dampers to isolate. Pressure will continue to rise until the Blowout Panels actuate
d.	Incorrect - Although this would be the exhaust path if there were a Reactor Enclosure Isolation signal, an isolation signal does not exist, therefore Standby Gas and RERS will not be running.

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	M-76		
Learning Objective:	LLOT0190.06		
Knowledge/Ability:	290001 K1.02	Importance:	3.4/3.6
(Description of K&A, from catalog)			
Knowledge of the physical connections and/or cause-effect relationship between SECONDARY CONTAINMENT and the following: Primary Containment system			

Prepared by: Lee Stanford

Question: 51

51 of 100

ATTACHMENT Q51 IS PROVIDED

Unit 1 initial plant conditions are as follows:

- Reactor power is 100%
- Steam Seal Evaporator (SSE) level as indicated by LI-07-157 on 10C653 is 0 inches

An Equipment Operator notifies the Main Control Room that the Instrument Air line to valve LV-C-07-157, Steam Seal Evap Feed In, has ruptured.

WHICH ONE of the following describes the effect of the air leak on SSE level and the action required to mitigate the level change?

	<u>Effect on SSE Level</u>	<u>Action Required to Mitigate Level Change</u>
a.	Rise	Close HV-007-157, SSE Cond M/U Shutoff Valve (SUP)
b.	Lower	Close HV-007-158, SSE Steam Outlet Valve (OUTLET)
c.	Rise	Close HV-007-156, SSE Cond M/U Bypass Valve (BYPASS)
d.	Lower	Close 007-1053 and 007-1075, SSE Drain Valves

Answer Key and Question Data	
Question # <u>51</u>	
Choice	Basis or Justification
a.	Correct Answer - LV-C-007-157 will fail open on a loss of Instrument Air. With the valve full open, SSE level will rise. To prevent further SSE level rise, HV-007-157 must be closed.
b.	Incorrect - See justification for a
c.	Incorrect - See justification for a
d.	Incorrect - See justification for a

Required Attachments or Reference	M-07 Sheet. 2
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	M-02, M-05, M-07, ARC-MCR-106 A-4	
Learning Objective:	LLOT0495.07, LLOT2002.02	
Knowledge/Ability:	Generic 2.4.47	Importance: 3.4/3.7
(Description of K&A, from catalog) Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.		

Prepared by: Lee Stanford

Question: 52

52 of 100

With Unit 1 at 93% power, the "1B" Outboard MSIV inadvertently closes resulting in the following conditions:

- Reactor power rises to 109%
- Reactor pressure rises to 1064 psig
- Reactor level lowers to +32 inches
- Total core flow is 80%

No operator actions are taken.

WHICH ONE of the following annunciators will be alarmed?

- a. REACTOR HI PRESS (107 REACTOR G-2)
- b. REACTOR HI/LO LEVEL (107 REACTOR H-2)
- c. APRM UPSCALE TRIP/INOP (108 REACTOR B-3)
- d. MSIV NOT FULLY OPEN TRIP (107 REACTOR E-1)

Answer Key and Question Data

Question # 52

Choice	Basis or Justification
a.	Correct Answer – Reactor pressure above 1053 psig will cause this annunciator to alarm.
b.	Incorrect – RPV level must go below +30 inches for this annunciator to alarm.
c.	Incorrect – Reactor power must be above .66w+62.8% (115.8%) for this annunciator to alarm.
d.	Incorrect – More than one MSIV must close for this annunciator to alarm.

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	ARCs for annunciators listed		
Learning Objective:	LLOT0050.08		
Knowledge/Ability:	G2.4.46	Importance:	3.5/3.6
(Description of K&A, from catalog)			
Ability to verify that the alarms are consistent with the plant conditions.			

Prepared by: Craig Fritz

Question: 53

53 of 100

Unit 2 plant conditions are as follows:

- An ATWS in progress
- "2L" SRV is stuck open
- Suppression Pool level is 17 feet and steady
- "2A" RHR is operating in Suppression Pool Cooling mode
- "2A" Core Spray pump is running on minimum flow

WHICH ONE of the following instruments must be used to accurately determine when Suppression Pool temperature reaches 110 degrees F?

- a. "2A" RHR pump suction temperature
- b. "2A" Core Spray pump suction temperature
- c. "2A" RHR Heat exchanger outlet temperature
- d. Suppression Pool Temperature Monitoring System (SPOTMOS)

Answer Key and Question Data

Question # 53

Choice	Basis or Justification
a.	Correct Answer – per T-102, SPOTMOS is to be used unless SP level is below 17.8 ft, then RHR pump suction temp should be used if RHR pump is running.
b.	Incorrect – see “a” justification
c.	Incorrect – see “a” justification
d.	Incorrect – see “a” justification

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-102 Note 2	
Learning Objective:	LLOT1560.5	
Knowledge/Ability:	295026 A1.03	Importance: 3.9/3.9
(Description of K&A, from catalog)		
Ability to operate and/or monitor the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Temperature monitoring		

Prepared by: Tim Kan

Question: 54

54 of 100

ATTACHMENT Q54 IS PROVIDED

Unit 2 plant conditions are as follows:

- Drywell cooling has been lost due to an inadvertent isolation that cannot be bypassed
- Drywell temperature is 135 deg. F
- Drywell pressure is 0.8 psig
- Suppression pool airspace temperature is 123 deg. F
- Suppression pool pressure is 0.4 psig

WHICH ONE of the following describes the ability to vent the drywell per OT-101, "High Drywell Pressure"?

- a. Permitted until drywell pressure is less than 0.65 psig
- b. NOT permitted until drywell pressure is greater than 0.9 psig
- c. Permitted until drywell temperature is less than 134 deg. F
- d. NOT permitted until drywell temperature is greater than 137 deg. F

Answer Key and Question Data

Question # 54

Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – Using the given suppression pool airspace temperature and suppression pool pressure, the nitrogen mass to be used for the suppression pool is 8400 lbs (from Attachment 1); using Attachment 2, must use the next LOWER curve (8250) on OT-101 Attachment 2. 0.8 psig and 135 deg. F is above the 8250 lbs curve. Pressure rising to greater than 0.9 psig will result in conditions on the safe side of the curve, and venting is now permitted.
c.	Incorrect – See justification for b.
d.	Incorrect – Venting will not be permitted when temperature is above 137 deg. F. Temperature must be lower, or Drywell pressure higher for venting to be permitted.

Required Attachments or Reference	OT-101
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation			
Source:	New Exam Item		
Reference(s):	OT-101		
Learning Objective:	None found		
Knowledge/Ability:	295028 EA2.04	Importance:	4.1/4.2
(Description of K&A, from catalog)			
High Drywell Temperature: Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell pressure			

Prepared by: Craig Fritz

Question: 55

55 of 100

Unit 2 is at 100% reactor power.

An internal fault causes a loss of the 2B RPS UPS Static Inverter and the static switch fails to transfer power to the alternate source.

WHICH ONE of the following identifies a system isolation that will occur and the capability to bypass the isolation?

	<u>System Isolation</u>	<u>Bypass Capability</u>
a.	PCIG	NO
b.	RWCU	YES
c.	MSIV	NO
d.	DWCW	YES

Answer Key and Question Data

Question # 55

Choice	Basis or Justification
a.	Incorrect - Instrument Gas will isolate on a loss of 2B RPS UPS Static Inverter, however, the isolation can be bypassed.
b.	Incorrect - RWCU will isolate on a loss of 2B RPS UPS Static Inverter, however, RWCU does not have isolation bypass capability.
c.	Incorrect - Although an MSIV half isolation signal occurs on a loss of 2B RPS UPS Static Inverter, the MSIVs will remain open. An MSIV isolation can not be bypassed.
d.	Correct Answer - Drywell Chilled Water will isolate on a loss of 2B RPS UPS Static Inverter and the isolation can be bypassed.

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	E-2BY160		
Learning Objective:	LLOT0180.8		
Knowledge/Ability:	262002 K3.10	Importance:	2.7/2.8
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the UNINTERRUPTABLE POWER SUPPLY (AC/DC) will have on following: Containment Isolation			

Prepared by: Lee Stanford

Question: 56

56 of 100

Unit 1 plant conditions are as follows:

- 100% reactor power
- Normal electrical lineup

An overtemperature condition occurs on the "1A" RPS/UPS Static Inverter.

WHICH ONE of the following identifies the status of RPS and the power source for the 1AY160 panel following the overtemperature condition?

	<u>RPS Status</u>	<u>1AY160 Power Source</u>
a.	"A" Half-Scram	Safeguard 250 VDC
b.	"A" Half-Scram	Non-Safeguard 480 VAC
c.	No Scram	Safeguard 250 VDC
d.	No Scram	Non-Safeguard 480 VAC

Answer Key and Question Data	
Question # <u>56</u>	
Choice	Basis or Justification
a.	Incorrect - See "d"
b.	Incorrect - See "d"
c.	Incorrect - See "d"
d.	Correct Answer - The RPS UPS Static Inverters are normally powered from Safeguard 250 VDC. On a high temperature condition, the static switch will automatically transfer to the alternate source, a 480 VAC Non-Safeguard MCC. The transfer occurs fast enough that power is not lost to the RPS system.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	ARC-MCR-120, A-5	
Learning Objective:	LLOT0300.02	
Knowledge/Ability:	262002 K4.01	Importance: 3.1/3.4
(Description of K&A, from catalog) Knowledge of UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) design feature(s) and/or interlocks which provide for the following: Transfer from preferred power to alternate power supplies.		

Prepared by: Lee Stanford

Question: 57

57 of 100

Unit 1 plant conditions are as follows:

- A failure to Scram has occurred
- "1B" RPS channel has failed to de-energize
- T-216, "Manual Isolation and Vent of Scram Air Header" has successfully inserted all control rods

WHICH ONE of the following describes the indications shown by the SPDS "Scram Event Indicator" during the ATWS event and 6 seconds after the control rods are inserted?

	<u>During ATWS</u>	<u>6 Seconds After Control Rods Inserted</u>
a.	BLUE Border Box / No SCRAM	BLUE Border Box / No SCRAM
b.	RED Border Box / SCRAM RODS OUT	RED Border Box / SCRAM RODS OUT
c.	BLUE Border Box / No SCRAM	GREEN Border Box / SCRAM RODS IN
d.	RED Border Box / SCRAM RODS OUT	YELLOW Border Box / SCRAM CMD

Answer Key and Question Data

Question # 57

Choice	Basis or Justification
a.	Correct Answer - SPDS Scram Event Indicator will remain Blue with the text NO SCRAM if both channels of RPS do not de-energize and all rods full in reed switches are closed
b.	Incorrect - SPDS Scram Event Indicator will turn Red with the text SCRAM RODS OUT only if both channels of RPS fail to de-energize and all control rods are not fully inserted within 7 seconds of the SCRAM
c.	Incorrect - SPDS Scram Event Indicator will turn Green only if both channels of RPS drop out.
d.	Incorrect - SPDS Scram Event Indicator will turn Yellow only if both channels of RPS must de-energize and control rods are within 7 seconds of being inserted (scramming in)

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	None		
Learning Objective:	LLOT0768.4		
Knowledge/Ability:	295037A1.09	Importance: 2.8 / 3.0	
(Description of K&A, from catalog)			
SPDS/ERIS/CRIDS/GDS: Plant-Specific			
SCRAM Condition Present and Power Above APRM Downscale or Unknown			

Prepared by: Corey Goff

Question: 58

58 of 100

Unit 2 plant conditions are as follows:

- A LOCA has occurred resulting RPV level dropping below the top of active fuel and subsequent major fuel damage
- Drywell pressure is 18 psig

All automatic actions have occurred.

WHICH ONE of the following will provide accurate indication of offsite release rate?

- a. Off Gas post treatment Radiation Monitor
- b. South Stack Noble Gas Radiation Monitor
- c. North Stack Wide Range Accident Radiation Monitor
- d. Reactor Enclosure Ventilation Exhaust Radiation Monitor

Answer Key and Question Data	
Question # <u>58</u>	
Choice	Basis or Justification
a.	Incorrect – RPV level below –129 will result in a Group 1 isolation and MSIV closure. With a Group 1 isolation, steam flow through the off gas system will result and off gas radiation monitors will not reflect accurate release rates
b.	Incorrect – This would be correct if an isolation signal did not exist and Reactor Enclosure normal supply and exhaust fans were still in service
c.	Correct Answer – With drywell pressure greater than 1.68 psig, reactor enclosure ventilation will isolate automatically, and the reactor enclosure will align to SGTS, which exhausts to the North Vent Stack
d.	Incorrect – Since normal reactor enclosure exhaust is through the South Vent Stack, this would be correct if an isolation signal did not exist

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	GP-8, M-0076 P&ID	
Learning Objective:	LLOT0180.2	
Knowledge/Ability:	295038 A1.01	Importance: 3.9 /4.2
(Description of K&A, from catalog) Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE: Stack-gas monitoring system		

Prepared by: Corey Goff

Question: 59

59 of 100

ATTACHMENT Q59 IS PROVIDED

Unit 1 is at 100% Reactor power.

1 UNIT DIV 1 SFGD BATTERY CHARGERS TROUBLE alarms. An Equipment Operator reports that the 480 VAC MCC supply breaker for the 1A1D103 Battery Charger has tripped.

WHICH ONE of the following identifies the power supply for Division I DC loads following the trip of the 1A1D103 Battery Charger?

- a. 1A1 Battery only
- b. 1A2D103 Battery Charger only
- c. 1A1 and 1A2 Batteries
- d. 1A1 Battery and 1A2D103 Battery Charger

Answer Key and Question Data

Question # 59

Choice	Basis or Justification
a.	Incorrect - See "d"
b.	Incorrect - See "d"
c.	Incorrect - See "d"
d.	Correct Answer - The Division I DC Distribution system has 2 batteries and each battery has a battery charger. The battery chargers are the normal source of power for the DC system. With a trip of one of the battery chargers, the associated battery will begin to discharge. The second battery charger will continue to supply the DC bus.

Required Attachments or Reference	E-92 Sheet 1
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Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	ARC-MCR-120 G-1, E-33 sh. 1, E-92 sh. 1		
Learning Objective:	LLOT0690.2		
Knowledge/Ability:	263000 K1.02	Importance:	3.2/3.3
(Description of K&A, from catalog) Knowledge of the physical connections and/or cause effect relationships between D.C. ELECTRICAL DISTRIBUTION and the following: Battery charger and battery			

Prepared by: Lee Stanford

Question: 60

60 of 100

Unit 2 plant conditions are as follows:

- 100% reactor power
- Normal electrical lineup
- D22 Diesel Generator is running in standby during performance of ST-6-092-312-2, D22 DIESEL GENERATOR SLOW START OPERABILITY TEST RUN

A fault de-energizes the Division 2 DC Bus.

WHICH ONE of the following describes the ability to trip the D22 Diesel Generator manually and automatically?

	<u>Manually</u>	<u>Automatically</u>
a.	Emergency Stop on engine only	Auto trips enabled
b.	Emergency Stop on engine only	Auto trips disabled
c.	Emergency Stop on local panel only	Auto trips enabled
d.	Emergency Stop on local panel only	Auto trips disabled

Answer Key and Question Data	
Question # <u>60</u>	
Choice	Basis or Justification
a.	Incorrect - Auto trips require DC control power.
b.	Correct Answer - Diesel can only be tripped using mechanical trip on engine. Auto trips require DC control power to operate.
c.	Incorrect - Local diesel controls require DC control power.
d.	Incorrect - See "c"

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	E-33, Load Analysis	
Learning Objective:	LLOT0670.10	
Knowledge/Ability:	263000 K3.01	Importance: 3.4/3.8
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the D.C. ELECTRICAL DISTRIBUTION will have on the following: Emergency generators		

Prepared by: Lee Stanford

Question: 61

61 of 100

A Recirculation piping break occurs on Unit 1 inside primary containment resulting in RPV level lowering to -140 inches.

WHICH ONE of the following describes the status of the "1A" Instrument Air Compressor and Service Air Compressor?

- a. Both compressors are available without SE-10-1 breaker reset required
- b. Both compressors are NOT available until breakers are reset per SE-10-1
- c. "1A" Instrument Air Compressor is available; Service Air Compressor is NOT available until breaker is reset per SE-10-1
- d. Service Air Compressor is available; "1A" Instrument Air Compressor is NOT available until breaker is reset per SE-10-1

Answer Key and Question Data

Question # 61

Choice	Basis or Justification
a.	Incorrect – See justification for d.
b.	Incorrect – See justification for d.
c.	Incorrect – See justification for d.
d.	Correct Answer – "1A" instrument air compressor is powered from D134-R-H, and Service air compressor is powered from non-safeguard power. Only "1A" Instrument air compressor has a shunt trip relay that trips the breaker on a LOCA signal, and must be manually reset. RPV level lowering to -140 inches will generate a LOCA signal, and the the breaker for "1A" Instrument Air compressor must be reset per SE-10-1 before it can be operated again. The Service Air compressor will remain available after the LOCA signal due to being powered from non-safeguard power and having no shunt tripping mechanism for the breaker.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):			
Learning Objective:	LLOT0730.15		
Knowledge/Ability:	300000 K2.01	Importance: 2.8/2.8	
(Description of K&A, from catalog)			
Knowledge of electrical power supplies to the following: Instrument air compressor			

Prepared by: Craig Fritz

Question: 62

62 of 100

Unit 1 initial plant conditions are as follows:

- OPCON 4
- D13 Bus is out of service for bus repairs

A fire causes a loss of the D22 bus.

WHICH ONE of the following describes equipment available to support Unit 1 Shutdown Cooling?

	<u>RHR Pump</u>	<u>RHRSW Pump</u>
a.	"1A"	"0C"
b.	"1B"	"0D"
c.	"1C"	"0C"
d.	"1D"	"0D"

Answer Key and Question Data	
Question # <u>62</u>	
Choice	Basis or Justification
a.	Correct Answer – “1A” RHR pump is powered from D11, “0C” RHRSW pump is powered from D21. Both have power.
b.	Incorrect – “0D” RHRSW pump is powered from D22 which does not have power.
c.	Incorrect – “1C” RHR pump is powered from D13 which does not have power.
d.	Incorrect – “0D” RHRSW pump is powered from D22 which does not have power.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	E-D13, E-D22	
Learning Objective:	LLOT0660.3	
Knowledge/Ability:	600000 AA2.17	Importance: 3.1/3.6
(Description of K&A, from catalog)		
Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE:		
Systems that may be affected by the fire.		

Prepared by: Craig Fritz

Question: 63

63 of 100

Unit 1 initial plant conditions are as follows:

- Reactor power is 80%
- RPV pressure is 1027 psig

"1B" Outboard MSIV has failed closed. Current conditions are:

- Reactor power is 81%
- RPV Pressure is 1060 and stable
- One bypass valve is 40% open

WHICH ONE of the following describes the required immediate operator action per OT-102, Reactor High Pressure?

- a. Place the Reactor Mode Selector Switch to "SHUTDOWN"
- b. Raise EHC Pressure Set until all Bypass Valves are fully closed
- c. Depress Bypass Valve jack "CLOSE" pushbutton to fully close all Bypass Valves
- d. Reduce Reactor power until RPV pressure is below "REACTOR HI PRESS" setpoint

Answer Key and Question Data

Question # 63

Choice	Basis or Justification
a.	Incorrect – Scram is not required, or desired at this time, since no RPS scram setpoints have been exceeded.
b.	Incorrect – Raising EHC pressure set will not lower RPV pressure to below 1053, as is required by OT-102. OT-102 does not direct the operator to close the BPVs. They are open to help control pressure.
c.	Incorrect – Bypass valves cannot be closed using the jack, if they were not opened by the jack. OT-102 does not direct the operator to close the BPVs. They are open to help control pressure.
d.	Correct Answer – OT-102, Reactor High Pressure, includes as an immediate operator action: REDUCE Reactor power in accordance with GP-5, Steady State Operations, AND Reactor Maneuvering Shutdown Instructions to maintain Reactor pressure less than 1053 psig.

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	OT-102		
Learning Objective:	LLOT1540.02		
Knowledge/Ability:	295025 G2.4.49	Importance: 4.0/4.0	
(Description of K&A, from catalog)			
High Reactor Pressure: Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.			

Prepared by: Craig Fritz

Question: 64

64 of 100

Unit 1 plant conditions are as follows:

- Reactor Mode Switch is in "STARTUP"
- Shutdown Margin demonstration is in progress
- Shorting links are removed

SRM's indicate the following:

- "A" SRM 1.4×10^3 cps
- "B" SRM 6.4×10^4 cps
- "C" SRM 5.3×10^4 cps
- "D" SRM 2.4×10^4 cps

"A" SRM detector output fails to 2.5×10^5 cps.

WHICH ONE of the following describes the RPS Status based on the above conditions?

- a. Only "A" RPS de-energized (half-scam)
- b. Only "B" RPS de-energized (half-scam)
- c. Both "A" and "B" RPS de-energized (full scam)
- d. Neither "A" nor "B" RPS de-energized (no half or full scam)

Answer Key and Question Data

Question # 64

Choice	Basis or Justification
a.	Incorrect – see “c” justification
b.	Incorrect – see “c” justification
c.	Correct Answer – With the shorting links removed one SRM channel Trip/INOP will cause a full scram. One SRM indicating greater than 2×10^5 will cause the SRM to be upscale, and cause a full scram.
d.	Incorrect – see “c” justification

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	C71-1020 GE elementary drawings		
Learning Objective:	LLOT0240.8		
Knowledge/Ability:	215004 K3.01	Importance:	3.4/3.4
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the SOURCE RANGE MONITOR (SRM) SYSTEM will have on the following: RPS			

Prepared by: Tim Kan

Question: 65

65 of 100

Unit 1 plant conditions are as follows:

- RPV level is -150 inches and slowly lowering
- There are no RPV injection sources available
- All control rods are fully inserted

WHICH ONE of the following describes the earliest point at which an Emergency Blowdown will be performed per T-112, "Emergency Blowdown" and the reason for not performing an Emergency Blowdown until that point?

- a. -186 inches; Adequate core cooling is maintained
- b. -201 inches; Delays the emergency depressurization as long as possible
- c. -186 inches; Fuel cladding temperature is maintained below 1800 deg. F
- d. -201 inches; The actual fueled region of the fuel bundles is not uncovered

Answer Key and Question Data

Question # 65

Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – With no RPV injection, when RPV level lowers to below –161 inches, the steam cooling section of T-111 is entered. Fuel PCT does not exceed 1800 deg. F. until RPV level is below –201 inches, at which time T-111 step LR-16 directs leaving Steam Cooling and performance of an emergency depressurization. The bases for T-111 states: "The steam cooling strategy thus delays emergency RPV depressurization for as long as possible.
c.	Incorrect – See justification for b.
d.	Incorrect – See justification for b.

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-111 and T-111 Bases	
Learning Objective:	LLOT1560.05	
Knowledge/Ability:	295031 EK3.04	Importance: 4.0/4.3
(Description of K&A, from catalog)		
Knowledge of the reasons for the following responses as they apply to REACTOR LOW WATER LEVEL: Steam Cooling		

Prepared by: Craig Fritz

Question: 66

66 of 100

Unit 1 plant conditions are as follows:

- "1A" RHR loop is operating in Shutdown Cooling mode
- SHUTDOWN range RPV level currently indicates +50 inches
- UPSET range RPV level currently indicates +60 inches

WHICH ONE of the following describes the action that will ensure natural circulation is established if the "1A" RHR pump trips and the reason for this action?

- a. Raise RPV level to +65 inches on SHUTDOWN range; ensures water level above steam separator turnaround point
- b. Raise RPV level to +75 inches on UPSET range; ensures water level above steam separator turnaround point
- c. Raise RPV level to +65 inches on SHUTDOWN range; ensures water level above top of jet pump ram's head
- d. Raise RPV level to +75 inches on UPSET range; ensures water level above top of jet pump ram's head

Answer Key and Question Data

Question # 66

Choice	Basis or Justification
a.	Correct Answer – S51.8.B, precaution 3.3 states that " Maintaining vessel level above 60 inches on LI-42-*R605 at *OC602 OR 78 inches on LR-42-*R608 at OC603 will ensure proper natural circulation." LI-42-R605 is the SHUTDOWN level indicator, and LR-42-*R608 is the UPSET recorder. This ensures water level is above the turnaround point in the steam separators, which allows warm water that travels upward through the core to pass over to the downcomer, helping to establish a natural circulation flowpath.
b.	Incorrect – 75 inches on UPSET range does not meet the requirements of S51.8.B.
c.	Incorrect – 65 inches on SHUTDOWN is okay, but the top of the jet pump ram's head is not the reason, and would not promote natural circulation.
d.	Incorrect – 75 inches on UPSET range does not meet the requirements of S51.8.B, and water level at the top of the jet pump ram's head would not promote natural circulation.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	N

Source Documentation

Source:	New Exam Item		
Reference(s):	S51.8.B, precautions 3.3, 3.4		
Learning Objective:	LLOT0370.09		
Knowledge/Ability:	295001 AK2.03	Importance: 3.6/3.7	
(Description of K&A, from catalog)			
Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION and the following: Reactor water level			

Prepared by: Craig Fritz

Question: 67

67 of 100

Unit 2 plant conditions are as follows:

- An ATWS is in progress
- Reactor power is 3%

All three SLC pump control switches have just been taken to "START" at 20C603.

WHICH ONE of the following describes the expected response of the Standby Liquid Control System?

- a. All three SLC pumps start immediately
- b. All three SLC pumps starts after a 118 second time delay
- c. All three SLC pumps will start immediately IF reactor power rises to 4%
- d. All three SLC pumps will start 118 seconds IF reactor power rises to 4%

Answer Key and Question Data

Question # 67

Choice	Basis or Justification
a.	Correct Answer – If the control switch is actuated to start a SLC pump, the 4% power requirement and the 118 second time delay do not apply.
b.	Incorrect – See justification for a.
c.	Incorrect – See justification for a.
d.	Incorrect – See justification for a.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	S48.1.B		
Learning Objective:	LLOT0310.05		
Knowledge/Ability:	211000 K4.08	Importance:	4.2/4.2
(Description of K&A, from catalog) Knowledge of STANDBY LIQUID CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: System initiation upon operation of SBLC control switch			

Prepared by: Craig Fritz

Question: 68

68 of 100

Unit 2 plant conditions are as follows:

- An ATWS is in progress with power at 5%
- T-270 has been completed in the MCR and Aux. Equipment Room
- RPV pressure is 500 psig and slowly lowering
- Drywell pressure is 8.0 psig and slowly rising
- RPV level is -60 inches and steady

WHICH ONE of the following describes the response of the Core Spray system if RPV pressure lowers to 400 psig?

	<u>Core Spray Pumps</u>	<u>Core Spray Injection Valves</u>
a.	Start	Open
b.	Will not start	Open
c.	Start	Will not open
d.	Will not start	Will not open

Answer Key and Question Data

Question # 68

Choice	Basis or Justification
a.	Incorrect – See justification for d.
b.	Incorrect – See justification for d.
c.	Incorrect – See justification for d.
d.	Correct Answer – With T-270 completed in the AER, a LOCA signal (>1.68 psig dw pressure with less than 455 psig RPV pressure) will not automatically start the Core Spray pumps, or open the injection valves.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	N

Source Documentation

Source:	New Exam Item		
Reference(s):	T-270		
Learning Objective:	LLOT0350.07		
Knowledge/Ability:	209001 A3.02	Importance:	3.8/3.7
(Description of K&A, from catalog) Ability to monitor automatic operations of the LOW PRESSURE CORE SPRAY SYSTEM including: Pump start			

Prepared by: Craig Fritz

Question: 69

69 of 100

Unit 1 plant conditions are as follows:

- A Group I isolation occurred 10 minutes ago
- The reactor is shutdown and RPV pressure is 950 psig and lowering slowly
- HPCI has been manually placed in service for level and pressure control
- RPV level is +30 inches and steady
- No other injection sources are operating

The HPCI flow controller fails and will not control in "AUTO" and is placed in "MANUAL". No other operator actions are taken.

WHICH ONE of the following describes the HPCI parameter controlled and the effect on RPV level over the next thirty minutes?

	<u>HPCI Parameter Controlled</u>	<u>RPV Level Response</u>
a.	flow	remains steady
b.	flow	rises
c.	speed	remains steady
d.	speed	rises

Answer Key and Question Data

Question # 69

Choice	Basis or Justification
a.	Incorrect – See justification for d.
b.	Incorrect – See justification for d.
c.	Incorrect – See justification for d.
d.	Correct Answer – With the HPCI controller in MANUAL, the controller will maintain HPCI pump speed constant. Since RPV pressure is lowering, and HPCI speed (and therefore discharge pressure) remain constant, flow into the RPV will rise, causing RPV level to rise.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	UFSAR section 6.3.2.2.1		
Learning Objective:	LLOT0340.12		
Knowledge/Ability:	206000 K3.01	Importance:	4.0/4.0
(Description of K&A, from catalog) Knowledge of the effect that a loss or malfunction of the HIGH PRESSURE COOLANT INJECTION SYSTEM will have on the following: Reactor water level control			

Prepared by: Craig Fritz

Question: 70

70 of 100

Unit 1 plant conditions are as follows:

- Conditions exist requiring entry into T-112, Emergency Blowdown
- RPV pressure is 1000 psig
- All five ADS valves have just been opened by the Plant Reactor Operator

WHICH ONE of the following describes the RPV level instrument response in the first five (5) seconds after the ADS valves are opened and the reason for this response?

<u>Level Instrument Response</u>	<u>Reason</u>
a. Indicated RPV level rises	Pressure drop in the reactor causes more void production in the core
b. Indicated RPV level rises	Lower pressure felt in the level instrument reference legs
c. Indicated RPV level lowers	Valve opening causes more inventory loss from the RPV
d. Indicated RPV level lowers	Lower pressure felt in the level instrument variable legs

Answer Key and Question Data

Question # 70

Choice	Basis or Justification
a.	Correct Answer – Opening the ADS valves causes a rapid reduction in pressure, causing rapid void production, and causing water to be displaced into the downcomer, causing indicated level to rise.
b.	Incorrect – While level will rise, the pressure change in the reactor will be felt equally on both the variable and reference legs of the instruments, and therefore will not result directly in a change in indicated RPV level.
c.	Incorrect – RPV level will not initially lower
d.	Incorrect – RPV level will not initially lower, and the pressure change in the reactor will be felt equally on both the variable and reference legs of the instruments, and therefore will not result directly in a change in indicated RPV level.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	T-112 Bases		
Learning Objective:	LLOT0330.03		
Knowledge/Ability:	218000 A1.05	Importance: 4.1/4.1	
(Description of K&A, from catalog)			
Ability to predict and/or monitor changes in parameters associated with operating the AUTOMATIC DEPRESSURIZATION SYSTEM controls including: Reactor water level			

Prepared by: Craig Fritz

Question: 71

71 of 100

Unit 1 plant conditions are as follows:

- Rx power 100%
- 1AY160 has de-energized due to a fault 5 minutes ago

Drywell temperature has risen 8° F since the loss of 1AY160.

WHICH ONE of the following describes the primary reason for the rise in drywell temperature?

- a. RECW pump trip
- b. RECW system isolation
- c. Drywell Chiller compressor trip
- d. Drywell Chilled Water system isolation

Answer Key and Question Data

Question # 71

Choice	Basis or Justification
a.	Incorrect – Loss of 1AY160 will not cause an RECW pump trip.
b.	Incorrect – RECW will isolate, but does not have a significant impact on drywell temperature.
c.	Incorrect – Drywell chiller compressor will not receive a trip signal from a loss of 1AY160.
d.	Correct Answer – Loss of 1AY160 will cause DWCW isolation which will cause DW temp increase.

Required
Attachments or
Reference

Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	E-1AY160		
Learning Objective:	LLOT1566.02		
Knowledge/Ability:	295020.K3.03	Importance: 3.2/3.2	
(Description of K&A, from catalog)			
Knowledge of the reasons for the following responses as they apply to INADVERTENT CONTAINMENT ISOLATION: Drywell/containment temperature response			

Prepared by: Tim Kan

Question: 72

72 of 100

Unit 1 plant conditions are as follows:

- Plant startup in progress at 8% reactor power
- Reactor Mode Switch is in "STARTUP/HOT STANDBY"
- Control Rod 26-15 is at position 12 and is the selected rod
- Control Rod 26-15 has as an Insert Limit of 12 and a Withdraw Limit of 48
- All other control rods are at their desired positions

WHICH ONE of the following describes the indications and/or interlocks currently displayed by the Rod Worth Minimizer?

	<u>Insert Error</u>	<u>Insert Block</u>
a.	No	No
b.	No	Yes
c.	Yes	No
d.	Yes	Yes

Answer Key and Question Data

Question # 72

Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – with a control rod at its insert limit, the RWM will pre-block and provide an insert block. It will <u>not</u> provide an insert error, since the rod is not inserted beyond its insert limit.
c.	Incorrect – See justification for b.
d.	Incorrect – See justification for b.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	RE-73, L-S-37		
Learning Objective:	LLOT0095.03		
Knowledge/Ability:	201006 K4.01	Importance: 3.4/3.5	
(Description of K&A, from catalog) Knowledge of ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) design feature(s) and/or interlocks which provide for the following: Insert blocks/errors			

Prepared by: Craig Fritz

Question: 73

73 of 100

Unit 1 plant conditions are as follows:

- End of cycle coastdown with reactor power at 97%
- Both Reactor Recirculation Pumps are operating at approximately 110% speed

While attempting to slightly raise the speed of the "1A" Reactor Recirculation Pump, the 1A RECIRC M-G FLUID DRIVE SCOOP TUBE LOCK annunciator (111 RECIRC, B-3) alarms.

The Reactor Operator depresses the "LOWER" speed demand pushbutton for the "1A" Reactor Recirculation Pump.

WHICH ONE of the following describes the reason for the alarm and the expected response of the "1A" Reactor Recirculation Pump?

	<u>Reason for the alarm</u>	<u>Response to a lower speed demand signal</u>
a.	High electrical stop	Speed lowers
b.	High electrical stop	Speed does not change
c.	High mechanical stop	Speed lowers
d.	High mechanical stop	Speed does not change

Answer Key and Question Data

Question # 73

Choice	Basis or Justification
a.	Incorrect – speed will not change, since the scoop tube lock prevents the scoop tube positioner motor from being energized in either direction.
b.	Correct Answer – the scoop tube lock alarm is indicative of being on the high electrical stop, which will de-energize the scoop tube motor in both directions. A lower speed signal will not result in a change in recirc pump speed.
c.	Incorrect – The mechanical stop will not be reached until about 2% speed past the electrical stop, and speed will not change.
d.	Incorrect – The mechanical stop will not be reached until about 2% speed past the electrical stop.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):			
Learning Objective:	LLOT0040.14		
Knowledge/Ability:	202002 K3.05	Importance: 3.2/3.3	
(Description of K&A, from catalog)			
Knowledge of the effect that a loss or malfunction of the RECIRCULATION FLOW CONTROL SYSTEM will have on the following: Recirculation pump speed			

Prepared by: Craig Fritz

Question: 74

74 of 100

ATTACHMENT Q74 IS PROVIDED

Unit 2 plant conditions are as follows:

- 100% reactor power
- Main Generator output is 1175 MWe
- Main Generator reactive load is 240 MVAR with a power factor of 0.98
- Main Generator hydrogen pressure is 75 psig

The Power System Director requests maximum MVAR that can be provided by the generator without reducing MWe output.

WHICH ONE of the following describes the maximum MVAR output permitted?

- a. 250
- b. 395
- c. 470
- d. 560

Answer Key and Question Data	
Question # <u>74</u>	
Choice	Basis or Justification
a.	Incorrect – 250 could be believed to be correct if the candidate believes the 0.98 power factor must be maintained.
b.	Incorrect – 395 would be correct if the candidate misread the graph by using 1200 MWe instead of 1175 MWe.
c.	Correct Answer – Using GP-5 Attachment 5, Estimated Generator Capability Curve at Various Hydrogen Gas Pressures, with MW at 1175, the MVAR limit at the 75 psig hydrogen gas pressure line is approximately 470 MVARs.
d.	Incorrect – 560 would be correct if the candidate misread the graph by using 1150 MWe instead of 1175 MWe

Required Attachments or Reference	GP-5, Attachment 5 (Estimated Generator Capability Curve at Various Hydrogen Gas Pressures)
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	GP-5, Attachment 5	
Learning Objective:	LLOT0600.10	
Knowledge/Ability:	Generic 2.1.25	Importance: 2.8/3.1
(Description of K&A, from catalog) Ability to obtain and interpret station reference materials such as graphs/monographs/and tables which contain performance data.		

Prepared by: Craig Fritz

Question: 75

75 of 100

ATTACHMENT Q75 IS PROVIDED

Unit 2 plant conditions are as follows:

- A valid RWCU system isolation has occurred due to a low RPV level condition
- RPV level has been restored to +35 inches

WHICH ONE of the following describes the required actions to realign the RWCU system for operation?

- a. Perform an R1 reset and ensure the isolation valves automatically reopen
- b. Perform an R2 reset and ensure the isolation valves automatically reopen
- c. Perform an R1 reset and manually reopen the isolation valves from the MCR
- d. Perform an R2 reset and manually reopen the isolation valves from the MCR

Answer Key and Question Data

Question # 75

Choice	Basis or Justification
a.	Incorrect – see justification for d.
b.	Incorrect – see justification for d.
c.	Incorrect – see justification for d.
d.	Correct Answer – The low level isolation setpoint for RWCU is –38 inches, or lo-lo level. Using GP-8, this is isolation signal "B". GP-8 also shows the reset for this isolation signal to be an "R2" reset. Following the reset, the isolation valves must be manually reopened using the MCR handswitches to realign the system for operation.

Required Attachments or Reference	GP-8 (U/2) (Do not give GP-8.1, 8.2, 8.3, 8.4, or 8.5)
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Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	N

Source Documentation

Source:	New Exam Item		
Reference(s):	GP-8 (U/2)		
Learning Objective:	LLOT0180.02		
Knowledge/Ability:	223002 A4.03	Importance: 3.6/3.5	
(Description of K&A, from catalog)			
Ability to manually operate and/or monitor in the control room: Reset system isolations			

Prepared by: Craig Fritz

Question: 76

76 of 100

Unit 1 plant conditions are as follows:

- Reactor mode switch is in "STARTUP"
- Reactor pressure 940 psig
- Reactor power 3%
- HPCI is in full flow test CST to CST for ST-6-055-230-1, HPCI Pump, Valve and Flow test
- Suppression Pool Temperature is 97°F and rising slowly

WHICH ONE of the following describes required actions per Tech Specs for the conditions above?

- a. No action until average Suppression Pool temp exceeds 105°F
- b. Restore the average Suppression Pool temp $\leq 95^\circ\text{F}$ within 24 hours
- c. Be in HOT Shutdown within 12 hours and Cold shutdown within next 24 hours
- d. Secure HPCI and lower average Suppression Pool temp $\leq 95^\circ\text{F}$ within 24 hours

Answer Key and Question Data	
Question # <u>76</u>	
Choice	Basis or Justification
a.	Correct Answer – Per TS 3.4.6.2 Suppression Pool temperature limit is 105°F when performing a test that adds heat to the Suppression Pool. Testing is not required to be secured until 105°F in the Suppression Pool.
b.	Incorrect – see “a” justification
c.	Incorrect – see “a” justification
d.	Incorrect – see “a” justification

Required Attachments or Reference	Tech Specs
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.2

Source Documentation		
Source:	New Exam Item	
Reference(s):	Tech Spec 3.6.2.1	
Learning Objective:	LLOT0130.11	
Knowledge/Ability:	295026 Generic 2.23	Importance: 3.8
(Description of K&A, from catalog)		
Ability to track limiting conditions for operations: Suppression Pool High Water Temperature		

Prepared by: Tim Kan

Question: 77

77 of 100

Unit 1 initial plant conditions are as follows:

- 100% reactor power
- "1B" CRD pump is in service
- CST level is 32.6 ft
- "B" CRD Flow Control Valve is in service

The following annunciators have alarmed:

- 108 REACTOR G-1, "1A/1B CRD WATER PUMP TRIP"
- 108 REACTOR G-3, "1A/1B CRD PUMP SUCTION LO PRESS"
- 108 REACTOR H-4, "CRD CHARGING WATER LO PRESS"

WHICH ONE of the following describes the action required prior to restoring CRD operation?

- a. Raise CST level to above 33 feet per S08.0.C, Transferring Water Between the RWST and the CST
- b. Place alternate CRD Drive Water Filter in service per S46.6.C, Placing Alternate Control Rod Drive Water Filter in Service
- c. Open 46-1F045, "Pump Suction Filter Bypass Valve" per ON-107, Control Rod Drive System Problems
- d. Place FV-46-1F002A, "A CRD Flow Control Valve" in service per S46.6.B, Placing Alternate CRD Hydraulic System Flow Control Valve in Service

Answer Key and Question Data

Question # 77

Choice	Basis or Justification
a.	Incorrect – Raising CST level will not allow restart of the CRD pump, because CST level was not low enough to be the cause of the trip. CST must be at or below 29 ft. to cause the CRD pump to trip.
b.	Incorrect – inadequate flow through the CRD drive water filters may cause an alarm, but will not cause the CRD pump to trip.
c.	Correct Answer – Conditions that cause annunciator 108 REACTOR G-3, "1A/1B CRD PUMP SUCTION LO PRESS" to alarm will also cause the CRD pump to trip. ON-107, step 2.2.1 directs opening the suction filter bypass valve (46-1F045) and restarting the pump.
d.	Incorrect – Placing the alternate CRD flow control valve in service will not allow the pump to be restarted. This action would only be correct if the conditions indicated a failed flow control valve, or if drive flow was insufficient.

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation

Source:	New Exam Item		
Reference(s):	ON-107		
Learning Objective:	LLOT0070.05, 09		
Knowledge/Ability:	295022 G2.1.20	Importance: 4.2	
(Description of K&A, from catalog)			
Loss of CRD Pumps: Ability to execute procedure steps			

Prepared by: Craig Fritz

Question: 78

78 of 100

Unit 2 plant conditions are as follows:

- OPCON 4
- "2B" RHR is in Shutdown Cooling per S51.8.B, Shutdown Cooling/Reactor Coolant Circulation Operation Start-Up And Shutdown
- "0B" RHRSW Pump is in service
- Reactor coolant temperature is 190°F and slowly lowering

An electrical fault causes a loss of the 20 Station Aux Bus.

WHICH ONE of the following describes the effect on "2B" RHR Shutdown Cooling and the required action to restore cooling?

	Effect on "2B" RHR Shutdown Cooling	Required Action
a.	RHR Pump trips and can not be restarted	Start "2A" RHR in Shutdown Cooling mode per S51.8.B, Shutdown Cooling/Reactor Coolant Circulation Operation Start-Up and Shutdown
b.	Remains in service without heat exchanger cooling water	Start "0A" RHRSW Pump per S12.1.A, RHR Service Water System Startup
c.	RHR Pump trips and can not be restarted	Start "2D" RHR pump in Shutdown Cooling mode per S51.8.H, Use Of Dedicated LPCI Pumps For Shutdown Cooling/Reactor Coolant Circulation Operation (Startup And Shutdown)
d.	Remains in service without heat exchanger cooling water	Start "0D" RHRSW Pump per S12.1.A, RHR Service Water System Startup

Answer Key and Question Data

Question # 78

Choice	Basis or Justification
a.	Incorrect. "2B" RHR Pump is powered from D22 through the 101 Safeguard Bus and is not affected by a loss of the 20 Station Aux Bus. Loss of D12 will cause a trip of "0B" RHRSW Pump.
b.	Incorrect. While it is true that "2B" RHR will remain in service without heat exchanger cooling, starting "0A" RHRSW Pump will not support "2B" Shutdown Cooling since it can only be aligned to the "2A" RHR Heat Exchanger.
c.	Incorrect. See "a".
d.	Correct Answer – A loss of 20 Station Aux Bus will cause a loss of 201 Safeguard Bus and a loss of D12 until Dead Bus Transfer to the 101 Safeguard Bus occurs. This will trip the "0B" RHRSW Pump. "2B" Shutdown Cooling will remain in service without heat exchanger cooling. "0D" RHRSW can be aligned for cooling "2B" RHR Heat Exchanger.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	10CFR55.43.b.5

Source Documentation

Source:	New Exam Item		
Reference(s):	S51.8.B, S12.1.A		
Learning Objective:	LLOT0400.06		
Knowledge/Ability:	205000 A2.08	Importance:	3.5
(Description of K&A, from catalog) Ability to (a) predict the impacts of the following on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of heat exchanger cooling			

Prepared by: Tim Kan

Question: 79

79 of 100

Unit 1 plant conditions are as follows:

- OPCON 5 with fuel handling in-progress
- The LSRO on the refueling platform reports that a fuel bundle is being lowered into the core

While the bundle is being lowered, the RO reports that SRM "1B" count rate has risen from 230 cps to 475 cps.

WHICH ONE of the following describes the ability to continue lowering the bundle and what procedure provides guidance for the action?

	<u>Ability to continue lowering the bundle into the core</u>	<u>Procedure Guidance In</u>
a.	Continued lowering of the bundle is permitted	ON-120, "Fuel Handling Problems"
b.	Continued lowering of the bundle is permitted	FH-105, Core Component Movement – Core Transfers
c.	Bundle lowering may not continue until countrate stabilizes	ON-120, "Fuel Handling Problems"
d.	Bundle lowering may not continue until countrate stabilizes	FH-105, Core Component Movement – Core Transfers

Answer Key and Question Data	
Question # <u>79</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for d.
b.	Incorrect – See justification for d.
c.	Incorrect – See justification for d.
d.	Correct Answer – Since SRM countrate doubled once, per FH-105 step 3.7.4 lowering of the bundle must stop until countrate stabilizes at a value of less than 2 doublings, and no spiking or indication of SRM inoperability exists, then lowering the bundle may be continued. ON-120 entry is only required if SRM countrate doubles twice (i.e. one doubling would be from 230 to 460, a second doubling would be from 460 to 920)

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.6

Source Documentation		
Source:	New Exam Item	
Reference(s):	FH-105, ON-120	
Learning Objective:	LLOT0760.10	
Knowledge/Ability:	Generic 2.2.32	Importance: 3.3
(Description of K&A, from catalog)		
Knowledge of the effects of alterations on core configuration.		

Prepared by: Craig Fritz

Question: 80

80 of 100

ATTACHMENT Q80/Q91 IS PROVIDED

Unit 1 plant conditions are as follows:

- A steam leak exists in the outboard MSIV room
- Security reports the blowout panel from the steam chase to the North Stack area has actuated
- Reactor has been manually scrammed and all rods are full in
- Field Team Monitoring reports TEDE is 200 mrem/hr at the site Boundary and is expected to continue for 2 hours
- All efforts to isolate the steam leak have failed
- Outboard MSIV room temperature is 180°F and steady
- No other areas are exceeding Maximum Safe Operating (MSO) Temperatures

WHICH ONE of the following identifies the TRIP procedures that require entry and if a T-112 Emergency Blowdown is required?

	<u>TRIP Procedure Entry Required</u>	<u>T-112, Emergency Blowdown Required</u>
a.	T-103, Secondary Containment Control AND T-104, Radioactivity Release Control	Yes
b.	T-103, Secondary Containment Control, only	Yes
c.	T-103, Secondary Containment Control AND T-104, Radioactivity Release Control	No
d.	T-103, Secondary Containment Control, only	No

Answer Key and Question Data	
Question # <u>80</u>	
Choice	Basis or Justification
a.	Incorrect – see justification for “c”
b.	Incorrect – see justification for “c”
c.	Correct Answer – Site boundary release is at a Site Area Emergency, therefore entry into T-104 is required per LGS EAL annex Table 3-1. Release level is not at or approaching a General Emergency limit and 2 areas are not exceeding MSO, therefore T-112 not required.
d.	Incorrect – see justification for “c”

Required Attachments or Reference	LGS 3-1: Emergency Action Level (EAL) Matrix T-103 T-104
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	EP-AA-1008, T-103, T-104	
Learning Objective:	LLOT1560.02,6	
Knowledge/Ability:	Generic 2.4.1	Importance: 4.6
(Description of K&A, from catalog) Knowledge of EOP entry conditions and immediate action steps.		

Prepared by: Tim Kan

Question: 81

81 of 100

Unit 1 plant conditions are as follows:

- 100% reactor power
- Normal electrical lineup

A 220 KV Substation fault results in a Main Generator Lockout and loss of the 10 Station Aux Transformer. All automatic actions occur as designed.

WHICH ONE of the following describes the change, if any, in reactor pressure and level 10 seconds after the lockout and the procedural action required to mitigate this effect?

	<u>Change in Reactor Pressure and Level 10 seconds after Lockout</u>	<u>Procedural Action Required to Mitigate Effect</u>
a.	Reactor pressure and level will both be lower	Restore and maintain RPV level between +12.5 to 54 inches per T-101, RPV Control
b.	Reactor pressure will remain the same and reactor level will be lower	Restore and maintain RPV level between +12.5 to 54 inches per T-101, RPV Control
c.	Reactor pressure and level will both be lower	Restore reactor level to +35 inches by manually controlling Reactor Feedwater Pumps per OT-100, Reactor Low Level
d.	Reactor pressure will remain the same and reactor level will be lower	Restore reactor level to +35 inches by manually controlling Reactor Feedwater Pumps per OT-100, Reactor Low Level

Answer Key and Question Data

Question # 81

Choice	Basis or Justification
a.	Correct Answer - A Generator Lockout will initiate a Main Turbine Trip and subsequent Reactor Scram if power is above 30%. Reactor Pressure will drop immediately on the scram due to void reduction. Digital Feedwater Scram Profile will initiate on the valid scram signal which will run feed flow back to 10% 5 seconds after the scram. RPV level control in T-101
b.	Incorrect - Reactor pressure will drop following the scram.
c.	Incorrect - When the scram occurs, level control must be directed from T-101.
d.	Incorrect - Reactor pressure will drop following the scram and level control must be directed from T-101 following the scram.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	10CFR55.43.b.5

Source Documentation

Source:	New Exam Item		
Reference(s):	E-D11, E-10		
Learning Objective:	LLOT0640.06		
Knowledge/Ability:	295003 A2.02	Importance:	4.3
(Description of K&A, from catalog) Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: Reactor power/pressure/ and level			

Prepared by: Lee Stanford

Question: 82

82 of 100

ATTACHMENT Q82 IS PROVIDED

Unit 2 is in OPCIION 4 with the following conditions:

- The reactor has been shutdown for 20 days
- "2A" RHR pump is operating in Shutdown Cooling Mode
- "2B" RHR pump is inoperable
- RPV water temperature is currently 140 deg. F
- Reactor water level is being lowered following installation of the RPV Head

An automatic inadvertent isolation of HV-51-2F008 occurs.

WHICH ONE of the following describes required operator action, and the estimated minimum time before RPV temperature rises to 212 °F?

	<u>Required Action</u>	<u>Time to 212°F</u>
a.	Restore Shutdown Cooling per ON-121, Loss of Shutdown Cooling	13 hours
b.	Place "2C" RHR in Shutdown Cooling per S51.8.H, Use of Dedicated LPCI Pumps for Shutdown Cooling/Reactor Coolant Circulation Operation	13 hours
c.	Restore Shutdown Cooling per ON-121, Loss of Shutdown Cooling	15 hours
d.	Place "2C" RHR in Shutdown Cooling per S51.8.H, Use of Dedicated LPCI Pumps for Shutdown Cooling/Reactor Coolant Circulation Operation	15 hours

Answer Key and Question Data	
Question # <u>82</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Incorrect – See justification for b.
c.	Correct Answer – With SDC will be lost due to an inadvertent isolation, ON-121 must be entered. Using ON-121, Attachment 9, for a starting temperature of 140 deg. F, with the plant shutdown for 20 days the time to boiling would be about 15 hours. S51.8.H is not appropriate, since it will not defeat the isolation of HV-51-2F008.
d.	Incorrect – See justification for b.

Required Attachments or Reference	ON-121, S51.8.H
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	ON-121	
Learning Objective:	LLOT1550.03	
Knowledge/Ability:	295021 AA2.01	Importance: 3.6
(Description of K&A, from catalog) Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING: Reactor water heatup/cooldown rate		

Prepared by: Craig Fritz

Question: 83

83 of 100

Unit 2 initial plant conditions are as follows:

- "2H" SRV is stuck open
- Reactor Power is 50% with an ATWS in progress
- An EHC malfunction results in Reactor pressure at 870 psig and dropping
- Suppression Pool level 20 feet and stable
- Suppression Pool temperature 170°F and rising
- Suppression Pool pressure 10 psig and rising

"2H" SRV closes and reactor pressure rises to 1100 psig.

WHICH ONE of the following describes required actions for the conditions above?

- a. Rapidly depressurize using Turbine Bypass Valves per T-101, RPV Control, due to reactor pressure above 1096 psig
- b. Enter T-112, Emergency Blowdown, due to unsafe on PC/P-3 PRESS SUPP PRESS curve in T-102, Primary Containment Control
- c. Enter T-112, Emergency Blowdown, due to unsafe on SP/T-1 HEAT CAPACITY TEMP LIMIT curve in T-102, Primary Containment Control
- d. Reduce reactor pressure per T-101, RPV Control to maintain on the safe side of SP/T-1 HEAT CAPACITY TEMP LIMIT curve in T-102, Primary Containment Control, due to reactor pressure above 1096 psig

Answer Key and Question Data

Question # 83

Choice	Basis or Justification
a.	Incorrect - T-112, Emergency Blowdown is required due to exceeding SP/T-1 curve in T-102. T-101, step RC/P-1 states to exit RC/P leg if T-112 is required.
b.	Incorrect - At 20 feet Suppression Pool Level and Suppression Pool Pressure at 10 psig, PC/P-3 Press Supp Press curve in T-102 has not been exceeded.
c.	Correct Answer - T-112, Emergency Blowdown is required due to exceeding SP/T-1 curve in T-102. T-102 Bases does not allow reduction of Reactor Pressure to stay on safe side of curve if initial assessment of SP/T-1 curve parameters indicate unsafe side has been entered.
d.	Incorrect - See justification for "c".

Required Attachments or Reference	T-101, T-102
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Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	10CFR55.43.b.5

Source Documentation

Source:	New Exam Item		
Reference(s):	T-102, T-101		
Learning Objective:	LLOT1560.04		
Knowledge/Ability:	295030 Generic 2.4.16	Importance:	4.0
(Description of K&A, from catalog)			
Knowledge of EOP implementation hierarchy and coordination with other support procedures:			
Low Suppression Pool Water Level			

Prepared by: Tim Kan

Question: 84

84 of 100

The following has occurred on Unit 1:

- A feedwater level control malfunction has caused RPV level to rise to +130 inches
- "1A" RFP has tripped
- "1B" and "1C" RFPs failed to trip and were tripped manually by the RO
- The Reactor Mode switch has been placed in "SHUTDOWN"
- All other automatic plant functions have occurred as designed.
- No other operator actions have been taken

Current plant conditions are as follows:

- All control rods are fully inserted
- RPV level is +124 inches and lowering slowly
- RPV pressure is 1060 psig and steady
- All SRVs are operable

WHICH ONE of the following describes the proper directions to give the RO/PRO for RPV pressure control?

- a. Immediately reduce RPV pressure below 1053 psig using the Jack to open Bypass Valves per OT-102, "Reactor High Pressure"
- b. Immediately reduce RPV pressure below 1053 psig using Pressure Set to open Bypass Valves per OT-102, "Reactor High Pressure"
- c. When RPV pressure reaches 1096 psig, then reduce pressure using "1J" SRV per OT-110, "Reactor High Level"
- d. When RPV pressure reaches 1096 psig, then reduce pressure using "1K" SRV per OT-110, "Reactor High Level"

Answer Key and Question Data

Question # 84

Choice	Basis or Justification
a.	Incorrect – While OT-102 <u>does</u> direct reducing pressure to below 1053 psig, since the reactor is scrammed, OT-102 is no longer appropriate. Also, using BPVs with RPV level above the level of the main steam lines will jeopardize integrity of the BPV lines to the condenser.
b.	Incorrect - While OT-102 <u>does</u> direct reducing pressure to below 1053 psig, since the reactor is scrammed, OT-102 is no longer appropriate. Also, using BPVs with RPV level above the level of the main steam lines will jeopardize integrity of the BPV lines to the condenser.
c.	Correct Answer – With RPV level at +124 inches, the Main Steam lines are covered, and will be full (MSIVs do not automatically close on high level, and therefore are still open). OT-110 step 3.17 directs: IF Main Steam lines are flooded AND RPV pressure reaches 1096 psig, THEN perform the following: IF the B, C, OR J SRV is available, THEN manually cycle the B, C, OR J SRV to reduce/maintain RPV pressure below 700 psig.
d.	Incorrect – This is incorrect, because if B, C, or J SRV is available, they are to be used for the sustained opening for depressurization to below 700 psig because they have straight tailpipe runs through the suppression pool airspace and are therefore less likely to be broken in that area.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	OT-102, OT-110		
Learning Objective:	LLOT1540.05		
Knowledge/Ability:	295008 AA2.01	Importance:	3.9
(Description of K&A, from catalog)			
Ability to determine and/or interpret the following as they apply to HIGH REACTOR WATER LEVEL: Reactor water level			

Prepared by: Craig Fritz

Question: 85

85 of 100

Unit 1 is at 100% Power when the following occurs:

- A Feedwater transient results in the following
- Reactor Scram
- RPV level dropped to -45 inches
- HPCI and RCIC started and recovered level to +35 inches

WCS reports that Drywell Chilled Water has isolated with the following indications:

- Drywell Temperature 140° F
- Drywell Pressure 0.7 psig

WHICH ONE of the following describes the cause of the isolation (Valid or Inadvertent) and the effect on Drywell Pressure?

	<u>Cause of the Isolation</u>	<u>Effect on Drywell Pressure</u>
a.	Valid	Will remain constant until GP 8.5, Isolation Bypass of Crucial Systems is performed
b.	Inadvertent	Will rise until GP 8.5, Isolation Bypass of Crucial Systems is performed
c.	Valid	Will rise until GP-8.3, Isolation Reset is performed
d.	Inadvertent	Will remain constant until GP-8.3, Isolation Reset is performed

Answer Key and Question Data	
Question # <u>85</u>	
Choice	Basis or Justification
a.	Incorrect – See “b” justification
b.	Correct Answer – Isolation is inadvertent DWCW isolates on Drywell pressure of 1.68 psig or RPV level of –129 inches. Inadvertent isolation can be bypassed using GP-8.5. With DWCW isolated, Drywell Pressure and temperature will continue to rise.
c.	Incorrect – See “b” justification.
d.	Incorrect – See “b” justification.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	GP-8, 8.3, 8.5		
Learning Objective:	LLOT0180.6		
Knowledge/Ability:	295020 AA2.01	Importance:	3.7
(Description of K&A, from catalog)			
Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION: Drywell/containment pressure			

Prepared by: Tim Kan

Question: 86

86 of 100

ATTACHMENT Q86 IS PROVIDED

Unit 1 is at 100% reactor power.

A loss of power de-energizes solenoid valves SV-59-150A, N₂ Supply to ADS Sys and SV-59-152A, Long Term N₂ Supply To ADS System.

WHICH ONE of the following identifies the effect on the H, M and S SRVs and the action required to mitigate this effect?

	<u>Effect on H, M and S SRVs</u>	<u>Action Required to Mitigate the Effect</u>
a.	Partial loss of N ₂ Supply	Ensure Instrument Gas Bottle 1AS252 aligned to supply SRVs per S59.8.A, Placing Automatic Depressurization System Backup Nitrogen Supply System In Operation
b.	Total loss of N ₂ Supply	Ensure Instrument Gas Bottle 1AS252 aligned to supply SRVs per S59.8.A, Placing Automatic Depressurization System Backup Nitrogen Supply System In Operation
c.	Partial loss of N ₂ Supply	Align Diesel Generator Starting Air Receiver 1A1T558 to supply SRVs per SE-1-1, Protected Depressurization Control (Long Term Operation)
d.	Total loss of N ₂ Supply	Align Diesel Generator Starting Air Receiver 1A1T558 to supply SRVs per SE-1-1, Protected Depressurization Control (Long Term Operation)

Answer Key and Question Data

Question # 86

Choice	Basis or Justification
a.	Correct Answer - SV-59-150A failing closed will only affect one source of N ₂ to the H, S and M SRVs since each SRV can be supplied through two different supply lines. Backup Nitrogen bottles can be aligned through the SV-59-152A which fails open on a loss of power.
b.	Incorrect - See justification for "a".
c.	Incorrect - SE-1-1 will align Diesel Generator Starting Air Receiver to operate the C, A, N SRVs from the Remote Shutdown Panel.
d.	Incorrect - See justification for "c".

Required Attachments or Reference	M-59 Sheet 1
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	M-59, S59.8.A, SE-1-1		
Learning Objective:	LLOT0730.13, 14		
Knowledge/Ability:	218000 A2.03	Importance:	3.6
(Description of K&A, from catalog) Ability to (a) predict the impacts of the following on the AUTOMATIC DEPRESSURIZATION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of these abnormal conditions or operations: Loss of air supply to ADS valves			

Prepared by: Tim Kan

Question: 87

87 of 100

Unit 2 plant conditions are as follows:

- 100% reactor power
- RCIC blocked for turbine governor maintenance

The following sequence of events occur:

10:00 Hotwell leak results in loss of Condensate and Reactor Scram on Reactor low level
10:01 HPCI starts on Reactor Level 2
10:02 "B" Recirc suction line ruptures
10:04 A HPCI Isolation occurs on High Room Temperature due to steam leak
10:06 Station Blackout occurs

WHICH ONE of the following identifies the type of HPCI isolation that will occur and the procedural direction that will allow bypassing the isolation to re-inject with HPCI?

	Type of HPCI Isolation	Procedural Direction That Will Allow Isolation Bypass
a.	Outboard only	Isolation can be bypassed with Reactor Level < -161" per T-242, Defeat of HPCI/RCIC Isolation Logic
b.	Inboard and Outboard	Isolation can be bypassed with Reactor Level < -161" per T-242, Defeat of HPCI/RCIC Isolation Logic
c.	Outboard only	Isolation can be bypassed with Reactor Level <12.5 " per T-249, HPCI/RCIC High Area Temperature Isolation Bypass
d.	Inboard and Outboard	Isolation can be bypassed with Reactor Level <12.5 " per T-249, HPCI/RCIC High Area Temperature Isolation Bypass

Answer Key and Question Data

Question # 87

Choice	Basis or Justification
a.	Incorrect - On a valid HPCI Isolation, both Inboard and Outboard Isolation Valves will close.
b.	Correct Answer - An Inboard and Outboard Isolation will occur on a valid HPCI Room High Temperature. Per T-111, if Reactor Level drops below -161" and no system are injecting into the vessel, the Steam Cooling leg will direct bypassing the isolation per T-242.
c.	Incorrect - On a valid HPCI Isolation, both Inboard and Outboard Isolation Valves will close.
d.	Incorrect - Although T-101 will direct performance of T-249 to bypass the HPCI isolation, a prerequisite for performing T-249 is that it can not be performed if a steam leak is known to exist in the HPCI or RCIC room.

Required Attachments or Reference	T-101 T-111
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Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	10CFR55.43.b.5

Source Documentation

Source:	New Exam Item		
Reference(s):	T-101, T-111, T-242, T-249		
Learning Objective:	LLOT0340.07, LLOT1561.04		
Knowledge/Ability:	206000 A2.10	Importance:	4.1
(Description of K&A, from catalog) Ability to (a) predict the impacts of the following on the HIGH PRESSURE COOLANT INJECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: System Isolation			

Prepared by: Lee Stanford

Question: 88

88 of 100

Unit 1 plant conditions are as follows:

- OPCON 5 with Fuel Shuffle Part 2 in progress
- D12 Diesel Generator is blocked for Lube Oil Heat Exchanger repair
- D14 Diesel Generator Fuel Transfer Pump Motor Replacement in progress
- D14 Diesel Generator Day Tank level is 150 gallons
- D14 Diesel Generator Fuel Storage Tank level is 32,000 gallons

Maintenance requests a clearance application for the D13 Diesel Generator Air Start Receiver 1C1T558 to replace relief valve PSV-020-128C-1.

WHICH ONE of the following will permit removal of D13 Diesel Generator Air Start Receiver 1C1T558 from service?

- a. Restore D12 Diesel Generator to operable
- b. Add 1,800 gallons to D14 Diesel Generator Storage Tank
- c. Transfer 60 gallons to the D14 Diesel Generator Day Tank
- d. Ensure D13 Diesel Generator Air Start Receiver 1C2T558 pressure is greater than 225 psig

Answer Key and Question Data	
Question # <u>88</u>	
Choice	Basis or Justification
a.	Correct Answer – Per T.S. 3.8.1.2, 2 Diesel Generators are required to be operable. D12 Diesel Generator is inoperable due to the clearance process and D14 is inoperable due to day tank level less than 200 gallons, storage tank level less than 33,500 gallons and the transfer pump inoperable. The only action that will keep 2 Diesel Generators operable is to restore D12 Diesel Generator to operable.
b.	Incorrect - Although adding 1,800 gallons will restore storage tank to operable limits, D14 D/G will still be inoperable due to day tank level and transfer pump inoperability.
c.	Incorrect - Although adding 60 gallons will restore day tank to operable limits, D14 D/G will still be inoperable due to storage tank level and transfer pump inoperability.
d.	Incorrect - Both air receivers are required to be greater than 225 psig for D13 DG to remain operable.

Required Attachments or Reference	Tech Spec 3.8.1.2
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.2

Source Documentation			
Source:	New Exam Item		
Reference(s):	T.S. 3.8.1.2.a		
Learning Objective:	LLOT0670.13		
Knowledge/Ability:	264000 G2.2.24	Importance:	3.8
(Description of K&A, from catalog)			
Ability to analyze the affect of maintenance activities on LCO status: Diesel Generators			

Prepared by: Tim Kan

Question: 89

89 of 100

Unit 2 plant conditions are as follows:

- OPCON 5
- Reactor cavity flooded up to +496 inches
- "2B" RHR is operating in Shutdown Cooling Mode
- Reactor vessel hydrolazing in progress from the auxiliary platform
- LLRT in progress for "2A" Core Spray system per ST-4-LLR-161-2, "A Core Spray Pump Discharge"
- Both spent fuel pools are connected through the cask pit per S53.0.C, Connecting Fuel Storage Pools to Cask Storage Pit Including Cross Connecting Fuel Storage Pools
- Unit 1 Fuel Pool Cooling is in service with 2 pumps and 1 demineralizer
- Unit 2 Fuel Pool Cooling is not in service

A crud burst has caused Spent Fuel Pool radiation monitor alarms, with an indicated reading of 40 mr/hr.

WHICH ONE of the following describes an action that will reduce dose rates to Refuel Floor workers?

- a. Place Unit 2 Fuel Pool Cooling in service per S53.1.A, Startup and Temperature Control of Fuel Pool Cooling System
- b. Secure from Core Spray valve LLRT per ST-4-LLR-161-2, "A Core Spray Pump Discharge"
- c. Secure "2B" RHR from Shutdown Cooling mode per S51.8.B, Shutdown Cooling/Reactor Coolant Circulation Operation Start-up and Shutdown
- d. Install Fuel Pool Gates Between Fuel Storage Pool and Cask Storage Pit per M-097-009, Cask Loading Pit Gate Removal, Installation, Maintenance And Movement Of Fuel Pool Gates Between Storage/Repair Locations

Answer Key and Question Data

Question # 89

Choice	Basis or Justification
a.	Correct Answer – Placing additional Fuel Pool Cooling in service will help remove the radioactive particles in the water and reduce dose to Refuel Floor workers.
b.	Incorrect – Securing from the Core Spray valve LLRT will prevent further air bubbles from entering the reactor, but will not help to remove radioactivity from the water, and will not reduce Refuel Floor radiation levels..
c.	Incorrect – Securing Shutdown Cooling will not help remove radioactivity from the water, and will not reduce Refuel Floor radiation levels.
d.	Incorrect – Installing Fuel Pool gates will not lower Refuel Floor radiation levels.

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	10CFR55.43.b.4

Source Documentation

Source:	New Exam Item		
Reference(s):	S53.1.A		
Learning Objective:	LLOT0750.7		
Knowledge/Ability:	233000 G2.3.10	Importance:	3.3
(Description of K&A, from catalog)			
Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure: Fuel Pool Cooling/Cleanup			

Prepared by: Tim Kan

Question: 90

90 of 100

Unit 2 plant startup is in progress with the following two activities scheduled for the next two hours:

- Main Generator purging with hydrogen
- Traversing In-core Probe (TIP) operations

WHICH ONE of the following describes the plant personnel notifications that are required during this two hour period?

	<u>Notification for Generator Purge</u>	<u>Notification for TIP Operations</u>
a.	No cutting, smoking, welding, or open flames permitted in the Turbine Enclosure per S28.5.D, Generator Purging - CO2 to H2	Access restricted to Unit 2 Reactor Enclosure elevation 253' and 269' per SE-24, Inplant Evacuations
b.	No cutting, smoking, welding, or open flames permitted in the Turbine Enclosure per S28.5.D, Generator Purging - CO2 to H2	No access to TIP Room, TIP Room roof, and affected areas per S74.0.A, Operation of Traversing In-core Probe System
c.	Access restricted to the Unit 1 and Unit 2 Turbine Enclosure until Generator purging is complete per SE-24, Inplant Evacuations	Access restricted to Unit 2 Reactor Enclosure elevation 253' and 269' per SE-24, Inplant Evacuations
d.	Access restricted to the Unit 1 and Unit 2 Turbine Enclosure until Generator purging is complete per SE-24, Inplant Evacuations	No access to TIP Room, TIP Room roof, and affected areas, per S74.0.A, Operation of Traversing In-core Probe System

Answer Key and Question Data	
Question # <u>90</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for b.
b.	Correct Answer – S28.5.D requires making announcements prohibiting hot work in the turbine enclosure. S74.0.A requires making announcements prohibiting access to the area around the TIP rooms. SE-24, while appropriate for restricting access during abnormal conditions, is not used during normal evolutions. It is plausible as a distractor since an operator may think that no access is permitted in the Turbine enclosure during generator purge with hydrogen, and because 253' elevation has access restricted during TIP operation.
c.	Incorrect – See justification for b.
d.	Incorrect – See justification for b.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	S28.5.D, S74.0.A	
Learning Objective:	LLOT1563.01	
Knowledge/Ability:	Generic 2.1.14	Importance: 3.3
(Description of K&A, from catalog)		
Knowledge of system status criteria which requires the notification of plant personnel		

Prepared by: Craig Fritz

Question: 91

91 of 100

ATTACHMENT Q80/Q91 IS PROVIDED

Unit 1 plant conditions are as follows:

- A scram has been attempted due to an inadvertent SLC initiation as required by OT-104, Unexpected/Unexplained Positive or Negative Reactivity Insertion
- "B" RPS fails to de-energize
- Manual RRCS initiation was successful in inserting rods

WHICH ONE of the following identifies the Emergency Action Level and the role of the Shift Manager?

	<u>Emergency Action Level</u>	<u>Shift Manager Role</u>
a.	MS4	Direct Shift Communicator to initiate required State/Local notifications per EP-MA-114-100, Mid-Atlantic State/Local Notifications
b.	MA4	Direct Shift Communicator to initiate NRC Notification per EP-AA-114, Notifications
c.	MS4	Direct Shift Communicator to initiate NRC Notification per EP-AA-114, Notifications
d.	MA4	Direct Shift Communicator to initiate required State/Local notifications per EP-MA-114-100, Mid-Atlantic State/Local Notifications

Answer Key and Question Data	
Question # <u>91</u>	
Choice	Basis or Justification
a.	Incorrect - See justification for "d"
b.	Incorrect - See justification for "d"
c.	Incorrect - See justification for "d"
d.	Correct Answer - An ATWS where RPS fails to insert rods but ARI succeeds requires a Alert notification per EP-AA-1008. The Shift Communicator is required to make state and local notifications per EP-MA-114-100.

Required Attachments or Reference	LGS 3-1: Emergency Action Level (EAL) Matrix
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	Y	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	EP-AA-1008, EP-AA-112-100	
Learning Objective:	Exelon Generic lesson plan G5.08	
Knowledge/Ability:	Generic 2.1.06	Importance: 4.3
(Description of K&A, from catalog) Ability to supervise and assume management role during transients and upset conditions.		

Prepared by: Lee Stanford

Question: 92

92 of 100

Unit 1 plant conditions are as follows:

- 100% reactor power
- "1A" Isophase Bus Cooling Fan tripped
- "1B" Isophase Bus Cooling Fan started automatically

FIN team members removed the "1A" Isophase Bus Cooling Fan breaker per S34.2.C, "Removing/Installing an Isophase Fan MCC Breaker When Isophase Cooling is Required to be in Service" with the following conditions:

- "1A" Isophase Bus Cooling Fan handswitch has been placed in "OFF"
- "1B" Isophase Bus Cooling Fan handswitch has been placed in "MANUAL"
- Isophase Bus Fan Maintenance Bypass Switch HS-091-101 has been placed in "BYPASS".

WHICH ONE of the following describes the status of the "1B" Isophase Bus Cooling Fan after the "1A" Isophase Bus Cooling Fan breaker is removed, and the procedure that must be used to remove the breaker?

	Status of "1B" Isophase Bus Cooling Fan after "1A" Fan Breaker Removed	Procedure to use to remove the "1A" Isophase Bus Cooling Fan Breaker
a.	Running	MA-MA-716-004-1000, "Troubleshooting, Rework, and Testing (TRT) Control Manual for Peach Bottom and Limerick"
b.	Running	S93.0.B, "480 VAC Non-Safeguard MCC Compartment Removal"
c.	Not running	MA-MA-716-004-1000, "Troubleshooting, Rework, and Testing (TRT) Control Manual for Peach Bottom and Limerick"
d.	Not running	S93.0.B, "480 VAC Non-Safeguard MCC Compartment Removal"

Answer Key and Question Data	
Question # <u>92</u>	
Choice	Basis or Justification
a.	Incorrect – see justification for b.
b.	Correct Answer – S34.2.C is used to remove the breaker because it directs manipulation of the Maintenance Bypass switch, which prevents the running fan from tripping if the non-operating fan breaker is removed. Therefore, the operating fan will remain running. S34.2.C also directs using S93.0.B to remove the breaker. MA-AA-716-004-1000 is incorrect, since step 1.4 and 1.4.2 state that the T&RM shall not be used when an approved procedure, partial procedure, or TC could be used to cover the activity.
c.	Incorrect – see justification for b.
d.	Incorrect – see justification for b.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	S34.2.C, MA-MA-716-004-1000	
Learning Objective:	LLOT1570.01	
Knowledge/Ability:	Generic 2.2.17	Importance: 3.5
(Description of K&A, from catalog)		
Knowledge of the process for managing maintenance activities during power operations		

Prepared by: Craig Fritz

Question: 93

93 of 100

Unit 2 plant conditions are as follows:

- Reactor power is 100%
- There is a steam leak from the "4B" Feedwater Heater
- Dose rates in the "4B" Feedwater Heater room are 1500 mr/hour

Entry is required into the "4B" Feedwater Heater room to manually isolate the leak.

WHICH ONE of the following describes the type of Locked High Radiation Area and required authorization for release of key?

<u>Type of Locked High Radiation Area for "4B" Feedwater Heater Room</u>	<u>Required Authorization for Release of Key</u>
a. Level 1	RP Supervision
b. Level 1	Operations Shift Manager
c. Level 2	RP Supervision
d. Level 2	Operations Shift Manager

Answer Key and Question Data

Question # 93

Choice	Basis or Justification
a.	Correct Answer – Greater than 1000 mrem/hr but less than 15000 mrem/hr is a Level 1 Locked High Radiation Area per RP-LG-460-1010. Locked High Radiation Areas must be controlled per 10CFR20. RP supervision must maintain oversight of the keys to all Locked High Radiation Areas per RP-LG-460-1016
b.	Incorrect – see “a” justification
c.	Incorrect – see “a” justification
d.	Incorrect – see “a” justification

Required Attachments or Reference	
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Psychometrics

Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	2	N	10CFR55.43.b.4

Source Documentation

Source:	New Exam Item		
Reference(s):	RP-LG-460-1016, RP-LG-460-1010, 10CFR20		
Learning Objective:	Exelon Generic lesson plan RWT 55		
Knowledge/Ability:	Generic 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: Tim Kan

Question: 94

94 of 100

Unit 1 plant startup is in progress with the following conditions:

- Reactor power is 2%
- RPV pressure is 850 psig with three bypass valves open
- RPV level is +35 inches

The running CRD pump has tripped, and the standby pump cannot be started.

Accumulator trouble alarms have just been received for three withdrawn control rods.

WHICH ONE of the following describes the required operator action?

- a. Raise reactor pressure to greater than 900 psig per GP-2, Normal Plant Startup
- b. Place the reactor mode switch in the "SHUTDOWN " position per Technical Specifications
- c. Manually scram the reactor if a CRD pump cannot be started within 20 minutes per ON-107, Control Rod System Problems
- d. Declare the accumulators inoperable for the control rods with accumulator trouble alarms, and restore to operable within 8 hours per Technical Specifications

Answer Key and Question Data	
Question # <u>94</u>	
Choice	Basis or Justification
a.	Incorrect – TS LCO 3.1.3.5 action a.2.a.2 does not allow raising pressure to avoid having to place the mode switch in Shutdown.
b.	Correct Answer – T. S. LCO 3.1.3.5 action a.2.a.2 applies, which requires placing reactor mode switch in Shutdown if less than 900 psig.
c.	Incorrect – This would be correct if reactor pressure was 900 psig. (Action a.2.a.1)
d.	Incorrect – This would be correct if only one accumulator was inop. (Action a.1.a)

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	T.S. LCO 3.1.3.5	
Learning Objective:	LLOT0060.12	
Knowledge/Ability:	295006 G2.1.12	Importance: 4.0
(Description of K&A, from catalog)		
Ability to apply technical specifications for a system: SCRAM		

Prepared by: Craig Fritz

Question: 95

95 of 100

Unit 1 plant conditions are as follows:

- OPCIION 5
- Reactor Disassembly is progress per M-041-200, Reactor Pressure Vessel Disassembly
- Unit 1 Reactor Cavity is flooded and connected to the Unit 1 Spent Fuel Pool
- Seal #4 (Reactor Well Bottom Seal) is deflated and removed from service
- Unit 1 Dryer / Separator Equipment Pit is flooded and connected to the Unit 1 Reactor Cavity

A dropped shroud head bolt has resulted in the puncture and complete failure of Seal #3 (Reactor Well Top Seal).

WHICH ONE of the following describes the effect on Unit 1 Spent Fuel Pool Level and the action required to terminate Unit 1 Spent Fuel Pool Level Loss?

	Effect on Unit 1 Spent Fuel Pool	Action Required to terminate Unit 1 Spent Fuel Pool Level Loss
a.	Will lower until level is below top of irradiated fuel seated in the Spent Fuel Pool	Install Fuel Pool Gates Between Fuel Storage Pool and Reactor Well per M-097-009
b.	Will lower until level is below top of irradiated fuel seated in the Spent Fuel Pool	Install Dryer / Separator Storage Pool Stop Logs per M-041-023
c.	Will lower until level is 10 inches above top of Spent Fuel Rack	Install Fuel Pool Gates Between Fuel Storage Pool and Reactor Well per M-097-009
d.	Will lower until level is 10 inches above top of Spent Fuel Rack	Install Dryer / Separator Storage Pool Stop Logs per M-041-023

Answer Key and Question Data

Question # 95

Choice	Basis or Justification
a.	Incorrect – See “c” justification
b.	Incorrect – See “c” justification
c.	Correct Answer – During refueling operations the spent fuel pool is connected to the reactor cavity. The Dryer / Separator Pit is also connected to the reactor cavity. A loss of both Seal #3 and Seal #4 will result in the lowering level in the fuel pool as well as the Dryer / Separator Pit. ON-120, Fuel Handling Problems, directs the entry into S53.0.A for lowering Fuel Pool Level. Direction is provided in S53.0.A to install the Fuel Pool Gates. This action will isolate the Fuel Pool from the leaking seals in the Reactor Well. Replacing the stoplogs in the Dryer / Separator will have no effect on minimizing fuel pool level loss.
d.	Incorrect - See “c” justification

Required
Attachments or
Reference

Psychometrics

Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	N	10CFR55.43.b.5

Source Documentation

Source:	New Exam Item		
Reference(s):	ON-120, S53.0.A		
Learning Objective:	LLOT0750.1		
Knowledge/Ability:	295023 AA2.02	Importance:	3.7
(Description of K&A, from catalog)			
Ability to determine and/or interpret the following as they apply to Refueling Accidents: Fuel Pool Level			

Prepared by: Tim Kan

Question: 96

96 of 100

The following actions have been taken on Unit 2:

- A manual reactor scram was initiated from 100% power 10 minutes ago due to the trip of both Reactor Recirculation pumps
- RRCS was manually initiated 10 minutes ago
- Immediately after the RRCS initiation power dropped to 1.4% on all APRMs
- Standby Liquid Control (SLC) has not injected

Current Unit 2 plant conditions are as follows:

- All blue "SCRAM" lights are lit on the full core display
- All APRMs currently indicate 1.4%
- All IRMs are currently on Range 6 and stable
- All SRM count rates are currently 55,000 cps
- Suppression pool temperature has just reached 110 deg. F

WHICH ONE of the following describes the proper actions to be taken for Control Rod insertion and SLC injection per T-101, "RPV Control"?

	<u>Control Rods</u>	<u>Standby Liquid Control System</u>
a.	Perform T-214 and T-215 per steps RC/Q-5 and RC/Q-13	Manually inject SLC per step RC/Q-16
b.	Perform T-214 and T-215 per steps RC/Q-5 and RC/Q-13	Do not inject SLC per step RC/Q-4
c.	Perform T-217 and T-218 per step RC/Q-13	Manually inject SLC per step RC/Q-16
d.	Perform T-217 and T-218 per step RC/Q-13	Do not inject SLC per step RC/Q-4

Answer Key and Question Data	
Question # <u>96</u>	
Choice	Basis or Justification
a.	Incorrect – See justification for c.
b.	Incorrect – See justification for c.
c.	Correct Answer – The blue "SCRAM" lights being lit on the full core display indicate the Scram Valves are open, which requires selection from the left side of RC/Q-13, making T-217 and T-218 acceptable choices. SLC should be injected per step RC/Q-16. With all IRMs at range 6 or SRMs >50,000, shutdown criteria (Note #16) is not met per RC/Q-4 and continuing at step RC/Q-12 only is not appropriate and does not preclude the injection of SBLC.
d.	Incorrect – See justification for c.

Required Attachments or Reference	T-101
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	T-101	
Learning Objective:	LLOT1560.06	
Knowledge/Ability:	211000 G2.4.06	Importance: 4.0
(Description of K&A, from catalog)		
Standby Liquid Control System: Knowledge of symptom based EOP mitigation strategies		

Prepared by: Craig Fritz

Question: 97

97 of 100

A large break LOCA has occurred on Unit 2 with the following conditions:

- Reactor shutdown, all rods fully inserted
- RPV pressure has lowered to 40 psig
- Drywell pressure is 29 psig and rising slowly
- Drywell temperature is 315 deg. F and rising slowly
- Suppression Pool pressure 32 psig and rising slowly
- Suppression Pool temperature 160°F and rising slowly
- Suppression Pool level is 26 feet and steady
- All RPV level indicators are reading off-scale high

WHICH ONE of the following describes the required utilization of "2A" and "2B" RHR loops and the basis for this decision?

	Utilization of "2A" and "2B" RHR	Basis for Decision
a.	Inject into the RPV with both loops of RHR per T-116	Adequate Core Cooling is not assured
b.	Place both loops of RHR in Suppression Pool Cooling per T-102 and S51.8.A	Primary Containment is threatened by exceeding heat capacity temperature limit of the Suppression Pool
c.	Spray the Drywell with one loop of RHR and spray the Suppression Pool with the other loop of RHR per T-102 and T-225	Primary Containment is threatened by direct pressurization of the Suppression Pool
d.	Inject into the RPV with one loop of RHR per T-116 and spray the Drywell with the other loop of RHR per T-102 and T-225	Adequate Core Cooling is not assured AND Primary Containment is threatened by direct pressurization of the Suppression Pool

Answer Key and Question Data

Question # 97

Choice	Basis or Justification
a.	Correct Answer – Conditions given are on the unsafe side of the Reference Leg Saturation Limit Curve (DW/T-1) in T-102. This, together with all RPV level indicators rising to offscale high, will require the operators to declare RPV level unknown, and enter T-116. The prioritization for RHR pumps with level unknown (adequate core cooling is NOT assured) is to establish adequate core cooling first. For this reason, both T-102 steps PC/P-5 and PC/P-9 for spraying the suppression pool and drywell provide the direction to initiate sprays "unless required for core cooling". T-102 step SP/T-5 states "IF NOT required for core cooling, THEN operate 2 loops of Supp Pool Cooling". Therefore, since core cooling is not assured, suppression pool and drywell sprays and suppression pool cooling are not permitted.
b.	Incorrect – See justification for a.
c.	Incorrect – See justification for a.
d.	Incorrect – See justification for a.

Required Attachments or Reference	T-102, T-116
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	2	Y	10CFR55.43.b.5

Source Documentation			
Source:	New Exam Item		
Reference(s):	T-102, T-116		
Learning Objective:	LLOT1560.06		
Knowledge/Ability:	216000 G2.4.22	Importance:	4.0
(Description of K&A, from catalog) Nuclear Boiler Instrumentation: Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations			

Prepared by: Craig Fritz

Question: 98

98 of 100

Unit 1 plant conditions are as follows:

- 100% reactor power
- "1A" RECW Pump is blocked out for maintenance
- "1A" RWCU Pump is in service
- Non-Regen Heat Exchanger outlet temperature is 120°F

"1B" RECW Pump breaker trips on overcurrent.

WHICH ONE of the following describes the status of the RWCU system one minute later and the required procedural action?

	RWCU System Status One Minute Later	Required Procedural Action
a.	RWCU isolated and "1A" RWCU Pump tripped on low RWCU flow	Isolate RWCU pumps per S44.2.B, RWCU Recirculation Pump Shutdown
b.	"1A" RWCU Pump tripped on low RECW pressure and RWCU is not isolated	Isolate RWCU pumps per S44.2.B, RWCU Recirculation Pump Shutdown
c.	RWCU isolated and "1A" RWCU Pump tripped on low RWCU flow	Restart RWCU per S44.7.A, Reactor Water Cleanup Fast Startup
d.	"1A" RWCU Pump tripped on low RECW pressure and RWCU is not isolated	Restart RWCU per S44.7.A, Reactor Water Cleanup Fast Startup

Answer Key and Question Data	
Question # <u>98</u>	
Choice	Basis or Justification
a.	Incorrect - See justification for "b".
b.	Correct Answer - "1A" RWCU Pump will trip on low RECW pressure after 10 seconds. RWCU will not isolate on high Non Regenerative Heat Exchanger temperature until temperature reaches 140°F. ON-113, Loss of RECW, directs isolating the RWCU pump if it trips on loss of RECW.
c.	Incorrect - See justification for "b".
d.	Incorrect - See justification for "b".

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	N

Source Documentation		
Source:	New Exam Item	
Reference(s):	ON-113, ARC-MCR-112 G-2	
Learning Objective:	LLOT155003	
Knowledge/Ability:	204000 A2.01	Importance: 3.4
(Description of K&A, from catalog) Ability to (a) predict the impacts of the following on the REACTOR WATER CLEANUP SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of component cooling water		

Prepared by: Tim Kan

Question: 99

99 of 100

The following annunciators have alarmed in the MCR at the following times:

0900 hours: 118 SERVICE I-2, "UNIT 1 ISO PHASE BUS COOLER TROUBLE"

0901 hours: 002 VENT E-1, "HIGH TOXIC CHEMICAL CONC."

WHICH ONE of the following describes the action that is the highest priority?

- a. Don Self-Contained Breathing Apparatus per SE-2, Toxic Gas/Chlorine
- b. Reduce generator reactive load to zero (0 MVAR) to minimize Generator Stator amps per ON-101, Loss of Isolated Phase Bus Cooling
- c. Initiate Control Room chlorine / toxic chemical isolation per S78.8.A, Manual Initiation Of Control Room Radiation Or Chlorine / Toxic Chemical Isolation.
- d. Reduce power in accordance with GP-5 Appendix 2, Section 3.1, Reducing Rx Power, and Reactor Maneuvering Shutdown Instructions until Main Generator output current is less than 20,000 amps.

Answer Key and Question Data	
Question # <u>99</u>	
Choice	Basis or Justification
a.	Correct Answer – Immediate operator actions per SE-2 and Arc 002 VENT E-1 require Control Room operators to don SCBA's within 2 minutes for safety of the operators.
b.	Incorrect – This is a secondary action of SE-2
c.	Incorrect – Must assume loss of Isophase bus cooling, and it is not an immediate operator action
d.	Incorrect – Must assume loss of Isophase bus cooling, and it is not an immediate operator action

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	L	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	SE-2, ON-101, Arc 002 VENT E-1, Arc 118 SERVICE I-2	
Learning Objective:	LLOT1563.2	
Knowledge/Ability:	Generic 2.4.45	Importance: 3.6
(Description of K&A, from catalog) Ability to prioritize and interpret the significance of each annunciator or alarm.		

Prepared by: Craig Fritz

Question: 100

100 of 100

Unit 1 plant conditions are as follows:

- A fire has forced the evacuation of the MCR
- Reactor manually scrammed
- Reactor Mode Switch in "SHUTDOWN"
- Main Turbine is tripped
- MSIVs are closed

The fire spreads and results in a loss of Division 1 DC.

WHICH ONE of the following identifies the SRVs and required procedure for controlling reactor pressure and the associated reactor pressure indication to be used?

	<u>Appropriate Procedure</u>	<u>Reactor Pressure Indication</u>
a.	C, A, N SRVs per SE-1, Remote Shutdown	PI-42-1R011 (PI-C61-1R011) on panel 10C201
b.	ADS SRVs per SE-6, Alternate Remote Shutdown	PIS-42-1N690B, on panel 10C618
c.	C, A, N SRVs per SE-1, Remote Shutdown	PIS-42-1N690B, on panel 10C618
d.	ADS SRVs per SE-6, Alternate Remote Shutdown	PI-42-1R011 (PI-C61-1R011) on panel 10C201

Answer Key and Question Data	
Question # 100	
Choice	Basis or Justification
a.	Incorrect - See justification for "b".
b.	Correct Answer - SE-1 can not be used for pressure control due to loss of Division 1 DC which de-energizes C, A, N SRV controls from the Remote Shutdown Panel. The instrumentation used for pressure indication in SE-6 is PIS-42-1N690B.
c.	Incorrect - See justification for "b".
d.	Incorrect - PI-42-1R011 Pressure Indicator is powered from Division 1 DC and is not available.

Required Attachments or Reference	
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Psychometrics			
Cognitive (H, L)	H	PRA (Y/N)	SRO
Unit (1, 2)	1	N	10CFR55.43.b.5

Source Documentation		
Source:	New Exam Item	
Reference(s):	SE-1, SE-6, E-33, E-102, C61-1050-E-003	
Learning Objective:	LLOT0735.05	
Knowledge/Ability:	295016 AA2.03	Importance: 4.4
(Description of K&A, from catalog)		
Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT: Reactor Pressure		

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