EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	EPE 007 EK1.05	
	Importance	3.3	

K/A Statement: Knowledge of the operational implications of the following concepts as they apply to the reactor trip: Decay power as a function of time

Question # 1

Given the following plant conditions:

- A Reactor Trip occurred from 100% power concurrent with a loss of off-site power
- 15 minutes later, the operators are maintaining RCS Tavg at 547°F using the S/G ARV's in AUTOMATIC control

Which of the following correctly completes the statement below?

As ______(1)_______ , the ARVs' automatic setpoint must be____(2)____ over the next 3 to 4 hours to maintain Tavg at 547°F.

A. (1) decay heat decreases, resulting in a lower delta-T
   (2) raised

B. (1) natural circulation flow increases, resulting in a lower delta-T
   (2) raised

C. (1) natural circulation flow decreases, resulting in a higher delta-T
   (2) lowered

D. (1) decay heat decreases less than natural circulation flow decreases, resulting in a higher delta-T
   (2) lowered

Answer: A

Explanation/Justification:

A. Correct.: As decay heat lowers the reduction of heat into the RCS lowers Thot. In order to restore Thot and maintain Tavg, S/G pressure/temperature must be raised.

B. Incorrect: Natural circulation flow decreases as decay heat level decreases due to reduced core delta T.

C. Incorrect: Lowering ARV setpoint will lower S/G pressure/temperature and reduce RCS Tavg.

D. Incorrect: A lower delta T is required, not a higher delta T.

Technical References:	E-0 Background	
Proposed References to be provided:	None	
Learning Objective:	REP00C 2.01	
Question Source:	Bank	
Question History:	Last NRC Exam	Ginna 2006 Q1
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 5	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	EPE 009 EK2.03	
	Importance	3.0	

K/A Statement: Small Break LOCA-Knowledge of the interrelations between the small break LOCA and the following: S/G's

Question # 2

The crew transitions to FR-H.1, Response to Loss of Secondary Heat Sink, 15 minutes after a reactor trip.

Step 1 of FR-H.1 reads:

1. Check If Secondary Heat Sink Is Required:	
a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE	a. IF RWST level greater than 28% THEN return to procedure and step in effect. IF RWST level less than 28% THEN go to ES-1.3. TRANSFER TO COLD LEG RECIRCULATION. Step 1

Which of the following explains the **basis** for transitioning from FR-H.1 in the RNO column?

A. Cold leg recirculation has not occurred. Must return to the procedure and step in effect and monitor RWST level.

B. The intact S/G is not functioning as a heat sink. Core decay heat can be removed by the faulted SG.

C. Cold leg recirculation has not occurred. Must immediately transfer to cold leg recirculation.

D. The intact S/G is not functioning as a heat sink. Core decay heat can be removed by the RCS break flow.

Answer: D

Explanation/Justification:

This questions tests knowledge / understanding that small breaks (i.e., not large breaks) will require SGs to function as heat sinks for the core.

A. Incorrect: Plausible because the examinee may miss the significance of RCS pressure and S/G pressure relationship and focus on whether or not cold leg recirculation was required based on RWST level.

B. Incorrect: Plausible because while core heat removal may have been sufficient to remove decay heat until the faulted S/G dries out, long term heat removal is dependent on the availability of the intact S/G as a heat sink.

C. Incorrect: Plausible because the examinee may miss the significance of RCS pressure and S/G pressure relationship and determine that decay heat removal will depend on the establishment of cold leg recirculation flow path

D. Correct: With the loss of heat sink condition which warranted entry into FR-H.1, the check of RCS pressure less than S/G pressure determines whether break size is large enough to remove decay heat without reliance upon an intact S/G.

Technical References:	FR-H.1 Background	
Proposed References to be provided:	None	
Learning Objective:	RFRH1C 2.01	
Question Source:	Bank	
Question History:	Last NRC Exam	Ginna 2012 Q8
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	1
	Group #	1	1
	K/A #	APE 015 2.1.7	
	Importance	4.4	

K/A Statement: Reactor Coolant Pump Malfunctions – Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Question # 3

Given the following plant conditions:

The crew has entered AP-RCP.1, RCP Seal Malfunction.

'A' RCP parameters are as follows:

- Seal #1 leakoff indicates 0.9 gpm
- Seal #2 leakoff to the RCDT is 2.2 gpm
- Annunciator B-3, RCP 1A STAND PIPE HIGH LEVEL, is lit
- Annunciator B-17, RCP 1A NO 1 SEAL HI-LO FLOW 5.0 GPM 1.0 GPM, is lit
- Seal Injection flow is approximately 9 gpm
- Containment radiation levels are normal and stable

Based on the symptoms given, which ONE of the following identifies the most likely cause of these indications relating to #1, #2 and #3 Seals?

A. ONLY #1 Seal has failed.

B. ONLY #2 Seal has failed.

C. ONLY #3 Seal has failed.

D. BOTH #1 AND #2 Seals have failed.

Answer: B

Explanation/Justification:

A. Incorrect. Seal #1 failure would be indicated by >8 gpm total seal flow or <0.8 gpm seal flow if # seal is the only problem.

B. Correct. Per attachment 15-1 standpipe high level is indication of Seal #2 failure and with 2.2 gpm leakoff is abnormally high.

C. No indication of Seal #3 being failed. No rise in contamination radiation levels..

D. Incorrect. Both seals have not failed. Seal #1 failure would be indicated by >8 gpm total seal flow or <0.8 gpm seal flow.

Technical References:	AP-RCP.1, EOP ATT-15.1	
Proposed References to be provided:	None	
Learning Objective:	RAP14C 2.01	
Question Source:	Bank ID 1680496	
Question History:	Last NRC Exam	Ginna 2007 Q#1
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 025 AA2.04	
	Importance	3.3	

K/A Statement: Loss of RHR System – Ability to determine and interpret the following as they apply to the Loss of RHR System: Location and isolability of leaks

Question # 4

Given the following plant conditions:

- An SI has occurred due to a LOCA outside of containment.
- The source of RCS leakage is back-leakage from either V-853A or V-853B, RHR Inlet Check Valves to the Reactor Vessel Core Deluge Line.
- The leak location is on the common RHR HX discharge line to the reactor vessel and Loop 'B' cold leg.
- The crew has transitioned from E-0, Reactor Trip or Safety Injection, to the appropriate procedure

Which of the following identifies:

(1) The COMPONENT that, when closed, could result in leak isolation
AND
(2) The RCS PRESSURE CHANGE as a result of the successful leak isolation?

A. (1) MOV-721, RHR Pump Discharge to Loop 'B' Cold Leg
(2) Pressure RISES

B. (1) MOV-721, RHR Pump Discharge to Loop 'B' Cold Leg
(2) Pressure LOWERS

C. (1) MOV-852B, RHR Pump Discharge to Reactor Vessel Deluge
(2) Pressure RISES

D. (1) MOV-852B, RHR Pump Discharge to Reactor Vessel Deluge
   (2) Pressure LOWERS

Answer: C

Explanation/Justification:

A. The leak is back leakage from either 853A or B. MOV-721 is not in that line and therefore would not isolate the leak

B. Incorrect: The leak is back leakage from either 853A or B. MOV-721 is not in that line and therefore would not isolate the leak

C. Correct: If MOV-852B is the successful isolation, then RCS pressure will rise since one of the SI paths has been isolated.

D. Incorrect: If MOV-852B is the successful isolation, then RCS pressure will rise, not lower since one of the SI paths has been isolated.

Technical References:	ECS-1.2	
Proposed References to be provided:	None	
Learning Objective:	REC12C 2.01	
Question Source:	Bank ID 1680712	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 3 55.43 (b) 5	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 026 AA1.02	
	Importance	3.2	

K/A Statement: Loss of CCW - Ability to operate and/or monitor the following as they apply to the Loss of Component Cooling Water: Loads on the CCWS in the control room.

Question # 5

The plant was operating at 100% power when the following conditions occurred:

- Component Cooling Water (CCW) Surge Tank level began to lower
- The operating crew entered AP-CCW.2, Loss of CCW During Power Operation
- CCW Surge Tank Level has stabilized using the normal makeup supply from RMW
- An EO reports that Seal Water Return Heat Exchanger flows and temperatures are outside of normal readings
- The Seal Water Return Heat exchanger has been bypassed and isolated
- All other CCW isolation valves remain in normal alignment

Which of the following describes the expected response of:

(1) Volume Control Tank temperature; **AND**
(2) Pressurizer Relief Tank level

A. (1) Rises
   (2) Remains the same

B. (1) Rises
   (2) Rises

C. (1) Remains the same
   (2) Rises

D. (1) Remains the same
   (2) Remains the same

Answer: A

Explanation/Justification:

A. Correct: Seal Water return flow is going directly to the VCT (without cooling) but, since MOV-313 remains open, the relief in the return line will not be opening to the PRT.

B. Incorrect: Plausible because the first part is correct. The second part would be correct if the seal water heat exchanger was not bypassed and the return flow path was through relief V-314 while the leak location is in progress.

C. Incorrect: Plausible because this would be correct if the seal water heat exchanger was not bypassed and the return flow path was through relief V-314.

D. Incorrect: Plausible if the applicant thinks that seal water return flow will discharge to another tank (e.g., RDCT) through relief V-314.

Technical References:	AP-CCW.2, Steps 6 & 7
Proposed References to be provided:	None
Learning Objective:	RAP02C 2.01
Question Source:	Bank
Question History:	Last NRC Exam Ginna 2012 RO Retake Q7
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7

Comments:

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Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 027 G2.1.7	
	Importance	4.4	

K/A Statement: PPCS Malfunction - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Question # 6

Given the following plant conditions:

- 100% power with all major controllers in AUTO
- Normal controlling channel input selected for HC-431K, PRZR PRESS CONTROLLER
- PRZR Backup Heaters are energized
- RCS Pressure Channels (PT-420 & PT-420A) indicate 2260 psig and rising

Assuming no operator action is taken, which ONE of the following identifies the failed channel, AND includes the system response to this failure?

A. PT-429 failed; the PRZR spray valves will modulate open

B. PT-429 failed; one PRZR PORV will open

C. PT-449 failed; the PRZR spray valves will modulate open

D. PT-449 failed; one PRZR PORV will open

Answer: D

Explanation/Justification:

A. Incorrect. Plausible since there are two control channels and the applicant who lacks detailed knowledge may confuse the purpose of PT-429. PT-429 is a control channel but is not the normally selected controlling channel. Spray valves will not open due to the controlling channel failure LOW..

B. Incorrect. As noted above,the applicant who lacks detailed systems knowledge may confuse their functions; PT-429 is not the normally selected controlling channel.

C. Incorrect: Plausible because PT-449 has failed low to turn on heaters, and sprays would not operate due to low pressure signal from 431K

D. Correct: Due to the malfunction, spray valves will not respond to the pressure increase, due to the controlling channel failing low. However, PT-429 and PT-430 will open PORV-430 when pressure rises to 2335 psig.

Technical References:	P-10, STEP 5.2.C.3	
Proposed References to be provided:	None	
Learning Objective:	RIC02C 1.06	
Question Source:	Bank	
Question History:	Last NRC Exam	2012 RO Retake Q#10
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 7	
Comments:		

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	EPE 038 EA1.34	
	Importance	4.2	

K/A Statement: SGTR - Ability to operate and monitor the following as they apply to a SGTR: Obtaining shutdown with natural circulation

Question # 7

Given the following plant conditions:

- The plant was operating at 100% power when a Loss of Offsite Power (LOOP) occurred
- Subsequently a Steam Generator Tube Rupture (SGTR) occurred on 'A' Steam Generator
- Operators have entered E-3, Steam Generator Tube Rupture

Which statement(s) below correctly describe(s) plant response to the given conditions, <u>as compared to</u> a similar event with off-site power available?

With offsite power **NOT** available, ...

1. RCS pressure will lower more rapidly.

2. Steam Generator pressure will rapidly rise to a higher value.

3. Pressurizer level will more rapidly rise during the depressurization.

4. Flashing in inactive RCS regions will be more likely.

A. 1 ONLY

B. 2 ONLY

C. 3 AND 4 ONLY

D. 2, 3 AND 4 ONLY

Answer: D

Explanation/Justification:

A. Incorrect: RCS pressure lowers more slowly due to lower RCS flow and therefore slower heat transfer from the primary to secondary.

B. Incorrect: Although 2 is correct, 3 and 4 are also correct.

C. Incorrect: Although 3 and 4 are correct, S/G Pressure will also rise rapidly.

D. Correct: Without offsite power available, the steam dump valves, which bypass the turbine to the condenser, will remain closed. Hence, energy transferred from the primary will rapidly increase steam generator pressures after reactor trip until the atmospheric relief valves lift to dissipate this energy. Due to depressurizing with the ARVs instead of the steam dumps will cause pressurizer level to rapidly rise. Also voiding in the head can cause the cooldown to be slower.

Technical References:	E-3 Background Information (Sections 2.1 and 2.2)	
Proposed References to be provided:	None	
Learning Objective:	REP03C 1.02	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehensive	
10 CFR Part 55 Content:	55.41 (b) 10	
Comments:		

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Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 054 AK1.02	
	Importance	3.6	

K/A Statement: Knowledge of the operational implications of the following concepts as they apply to the Loss of Main Feedwater: Effects of feedwater introduction on dry S/G.

Question # 8

Given the following plant conditions:

- The crew is performing FR-H.5, Response to Steam Generator Low Level, for 'A' S/G
- 'A' S/G wide range level is 130 inches and lowering slowly
- Containment pressure is 6 psig and slowly rising
- AFW flow has NOT been established to 'A' S/G

Assuming conditions continue to deteriorate, "A" S/G will transition to being considered "dry" when wide range level drops below __(1)__ and, per the FR-H.5 background document, feed flow should not be established to a "dry" S/G because ______(2)______ .

A. (1) 50 inches
(2) significant thermal stresses could be caused on S/G components when the relatively cold feedwater flow is reinitiated

B. (1) 50 inches
(2) feedwater introduction could result in an uncontrolled RCS cooldown and reduction in shutdown margin

C. (1) 100 inches
(2) significant thermal stresses could be caused on S/G components when the relatively cold feedwater flow is reinitiated

D. (1) 100 inches
(2) feedwater introduction could result in an uncontrolled RCS cooldown and reduction in shutdown margin

Answer: C

Explanation/Justification:

A. Incorrect: Wrong minimum level.

B. Incorrect: Wrong minimum level.

C. Correct: Correct level and basis

D. Incorrect. Wrong basis.

Technical References:	FR-H.5 Background Document
Proposed References to be provided:	None
Learning Objective:	RFRH5C 2.01
Question Source:	Bank ID 1680632
Question History:	Last NRC Exam NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	EPE 055 EK1.02	
	Importance	4.1	

K/A Statement: Knowledge of the operational implications of the following concepts as they apply to the station blackout: Natural circulation cooling

Question # 9

The plant was at 100% power when a reactor trip and a station blackout occurred.

The crew has entered ECA 0.0, Loss of All AC Power, and is ready to start a RCS cooldown.

Step 23 directs, "*Initiate Depressurization Of Intact S/G's To 360 PSIG.*"

The first caution prior to step 23 states, S/G pressures should be maintained GREATER than 260 psig.

Which ONE of the following correctly identifies the basis for the Caution prior to Step 23?

A. Pressurizer level indication will be lost and upper head voiding may occur.

B. S/G narrow range level will lower to less than 7%.

C. SI Accumulator nitrogen will be injected into the RCS.

D. RCS cooldown rate will be excessive.

Answer: C

Explanation/Justification:

A. Incorrect: Plausible because step 23 has a note stating that pressurizer level will be lost but this is not the reason to maintain greater than 260 psig in the S/G's.

B. Incorrect: Plausible because caution #2 prior to step 23 directs maintaining S/G level above 7%, however incorrect because lowering below 7% is not the reason to maintain S/G pressure

above 260 PSIG.

C. Correct: Caution is to prevent nitrogen injection from accumulators which could theaten natural circulation flow.

D. Incorrect: Plausible because step 23 has a note discussing controlled cooldown of the RCP seals, but this is not the reason to maintain greater than 260 psig in the S/G's.

Technical References:	ECA 0.0 and Background document	
Proposed References to be provided:	None	
Learning Objective:	REC00C 1.02	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 10	
Comments:	KA is matched	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 056 G2.4.20	
	Importance	3.8	

K/A Statement: Loss of Offsite Power - Knowledge of the operational implications of EOP warnings, cautions, and notes.

Question # 10

Given the following plant conditions:

- The plant has experienced a large break LOCA concurrent with a Loss of Offsite Power
- Neither EDG started automatically
- 'A' EDG was started from the main control board and is powering Bus 14 and 18
- 'A' EDG load is currently 2155 KW

Which ONE of the following is (1) the LONGEST amount of time that the EDG can be allowed to operate under these conditions, and (2) assuming no additional electrical loads are started on Bus 14 or Bus 18, the action (if any) that would be required to restore loading to within limits?

	(1)	(2)
A.	30 minutes	Reduce load by stopping redundant safeguards equipment.
B.	30 minutes	No action required, loading will be reduced as the LOCA progresses.
C.	2 hours	Reduce load by stopping redundant safeguards equipment.
D.	2 hours	No action required, loading will be reduced as the LOCA progresses.

Answer: D

Explanation/Justification:

This is a KA match because Att 8.5 has a caution *Observe EDG load limits when manually starting loads on the EDGs.*

A. Incorrect: Incorrect. Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 1 is plausible if the examinee does not recall the limits and believes he is above the maximum load rating. Part 2 is plausible (but incorrect) because there is redundancy in safeguards equipment, but loading is managed by Att-8.5, Loss of Offsite Power, and RNO actions in E-1 to check D/G loading prior to starting equipment.

B. Incorrect: Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 1 is plausible if the examinee does not recall the limits and believes he is above the maximum load rating. Part 2 is correct (see D below)

C. Incorrect: Part 1 is correct: Between the 1950 continuous and 2250 KW 2-hr limit, the D/G can be run for 2 hours. Part 2 is plausible (but incorrect) because there is redundancy in safeguards equipment, but loading is managed by Att-8.5, Loss of Offsite Power, and RNO actions in E-1 to check D/G loading prior to starting equipment.

D. Correct: Each D/G is rated at: 1950 KW continuous operation, 2250 KW for 2 hours and 2300 KW for % hour. This load rating could be allowed for up to 2 hours. As indicated in the UFSAR loading ratings, current on the CNMT Recirc Fans will decrease as CNMT pressure/moisture is reduced without operator actions.

Technical References:	AP Elec 14/16
Proposed References to be provided:	None
Learning Objective:	REP01C 1.04
Question Source:	Bank
Question History:	Last NRC Exam Ginna 2012 Q 13
Question Cognitive Level:	Comprehensive
10 CFR Part 55 Content:	55.41 (b) 8
Comments:	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 057 AK3.01	
	Importance	4.1	

K/A Statement: Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: Actions contained in EOP for loss of vital ac electrical instrument bus

Question # 11

Given the following plant conditions:

- The plant is at 100% power with all systems operating in automatic.
- The HCO observes all Channel 1 and 2 Bistable Status lights are extinguished.
- The HCO determines that 120 VAC Instrument Bus B has been lost.

Which ONE of the following identifies why the crew places Rod Control in Manual?

A. A Rod Block was generated preventing automatic rod control because Intermediate Range N36 has failed low.

B. A Rod Block was generated preventing automatic rod control because Loop A Tavg has failed low.

C. No Rod Block was generated, and rods are continuing to insert in auto because Turbine First Stage Channel PI485 has failed low.

D. No Rod Block was generated, and rods are continuing to insert in auto because Turbine First Stage Channel PI486 has failed low.

Answer: B

Explanation/Justification:

A. Incorrect. While it is true that Intermediate Range Channel 36 does fail on loss of Instrument Bus B (Indicated by Channel 2 Status lights LIT), the IR Rod Stop is bypassed at high power. This failure will have no effect on Rod Movement.

B. Correct. This failure will affect Rod Movement in AUTO because there is a rod block. Step 6.1.6 of ER-INST.3 directs placing Rods in Manual.

C. Incorrect. A failure of Instrument Bus B (Indicated by Channel 2 Status lights LIT) would cause Turbine Impulse Pressure to fail low. Since this input is used to compare Turbine power to Reactor power in the rod control circuitry, rod control would inappropriately think turbine power has gone down, and drive rods in an attempt to match reactor power, IF a rod block wasn't already present.

D. Incorrect. PI486 is powered by Instrument Bus C and will be unaffected for this event, but could potentially provide the same response as option C if selected

Technical References:	ER-INST.3
Proposed References to be provided:	None
Learning Objective:	R0901C, 1.06
Question Source:	Bank WTSI59476
Question History:	Last NRC Exam: 2011 Q47
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7

Comments: Added Channel 1 bistable lights to the Q stem as both Ch 1 and Ch 2 lights fed from Inst Bus 1B Bkr 8. See Lesson Plan R0901C, Slide 82.

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	1	
	K/A #	APE 058 AA2.01	
	Importance	3.7	

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

Question # 12

Given the following plant conditions:

- The plant is operating at 100% power.
- The following alarms are received in the Control Room:
  - Annunciator J-21, 1A OR 1B BATTERY UNDERVOLTAGE
  - Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE
- DC Bus 'A' voltage indicates 113 VDC and lowering slowly.

Which ONE of the following correctly completes the statement below?

The MINIMUM voltage at which the batteries may supply the 120 VAC inverter is ___(1)___ ; **AND**
Inverter 1A will ___(2)___ transfer(red) to the Class 1E CVT on **<u>loss</u>** of Battery 'A' to maintain 1A Instrument Bus energized.

A. (1) 109 VDC
   (2) automatically

B. (1) 109 VDC
   (2) be manually

C. (1) 95 VDC
   (2) automatically

D. (1) 95 VDC
(2) be manually

Answer: A

Explanation/Justification:

A. Correct: 109 VDC is minimum, and inverter 1A has a static switch

B. Incorrect: Correct voltage but inverter 1A will automatically swap. Other inverters must be manually swapped.

C. Incorrect: Voltage is too low and the inverter will have automatically swap.

D. Incorrect: Voltage is below the operability limit for the DC bus. Manual swap relates to their inverters, not 1A.

Technical References:	R0901C
Proposed References to be provided:	None
Learning Objective:	R0901C, 1.06
Question Source:	Bank
Question History:	Last NRC Exam Ginna 2011 SRO Retake Q52
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 062 AA2.03	
	Importance	2.6	

K/A Statement: Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The valve lineups necessary to restart the SWS while bypassing the portion of the system causing the abnormal condition.

Question # 13

Given the following plant conditions:

- The plant is at 80% power.
- A Service Water Leak is occurring.
- The crew is performing actions of AP-SW.1, Service Water Leak.
- Service Water Pumps A, B, and D are running.
- A controlled plant shutdown is in progress.
- Service Water Loop "A" pressure is 42 psig.
- Service water Loop "B" pressure is 50 psig.
- The US directs splitting Service water loops.

Which ONE of the following choices describes the operability of the Service Water System, and contains the MINIMUM actions for isolating components for the current plant conditions?

Entry to a Technical Specification action statement is ...

A. required; BOTH SW loop cross-ties in the Intermediate Building basement must be closed.

B. required; AT LEAST ONE D/G SW cross-tie must be closed, and AT LEAST ONE SW loop cross-tie in the Intermediate Building basement must be closed.

C. NOT required; BOTH SW loop cross-ties in the Intermediate Building basement must be closed.

D. NOT required; AT LEAST ONE D/G SW cross-tie must be closed, and AT LEAST ONE SW loop cross-tie in the Intermediate Building basement must be closed.

Answer: B

Explanation/Justification:

A. Incorrect: Both valves in each line are not required. Either valve will split the headers.

B. Correct: The system design requirement is 4 pumps <u>in a single loop</u>. The RO is expected to have this knowledge and to recognize that splitting the system therefore defeats the design requirement, which would make the system inoperable per TS, necessitating entry into the Service Water TS action statement.

C. Incorrect: Both valves in each line are not required. Either valve will split the headers. TS 3.7.8 must be entered.

D. Incorrect: TS 3.7.8 must be entered.

Technical References:	AP-SW.1 ATT 2.5 TS 3.7.8 Bases, Page 3.7.8-5 UFSAR Section 9.2.1	
Proposed References to be provided:	None	
Learning Objective:	R5101C 1.08, 1.12	
Question Source:	Bank	
Question History:	Last NRC Exam	Ginna 2007 Q52
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 065 AK3.04	
	Importance	3.0	

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

Question # 14

Given the following plant conditions:

- A steam line break occurred in Containment
- Condensate has been lost and auxiliary feedwater is unavailable
- The crew transitions from E-1, Loss of Reactor or Secondary Coolant to FR-H.1, Response to Loss of Secondary Heat Sink
- Bleed and Feed criteria have been met

Which ONE of the following choices correctly completes the following statement regarding establishment of an RCS bleed path?

PORVs will be opened to establish bleed and feed initially with ______(1)______ as the motive force for their operation because ______________(2)________________.

A. (1) Instrument Air
(2) Nitrogen will not be available

B. (1) Instrument Air
(2) Nitrogen capacity may be inadequate to maintain PORVs open for extended periods

C. (1) Nitrogen
(2) Instrument Air will not be available

D. (1) Nitrogen
(2) Instrument Air pressure may be inadequate causing PORVs to cycle closed and open

Answer: C

Explanation/Justification:

A. Incorrect: IA is not available due to FR-H.1 manually initiating CI to basically bottle up the containment.

B. Incorrect: IA is not available due to FR-H.1 manually initiating CI to basically bottle up the containment

C. Correct: In accordance with FR-H.1, step 15, Establish RCS Bleed path, the PORV control switches are placed in OPEN and the RCS Overpressure Protection System is aligned to OPEN both PORVs using nitrogen. According to the Background Document "The PORVs are initially opened using nitrogen because a previous step actuated SI and CI, resulting in the loss of Instrument Air to CNMT."

D. Incorrect: A note in FR-H.1 prior to Step 20 explains that PORVs may close temporarily until adequate IA pressure is restored when initially restoring IA to containment following establishment of bleed and feed. If CI were not actuated prior to bleed and feed, the subsequent RCS depressurization would automatically actuate CI, causing IA to isolate, which would cause PORVs to close until nitrogen was aligned. But the PORVs would not cycle closed then open on fluctuating IA pressure.

Technical References:	FR-H.1	
Proposed References to be provided:	None	
Learning Objective:	RFRH1C 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	APE 077 AA1.01	
	Importance	3.6	

K/A Statement: Generator Voltage and Electric Grid Disturbances-Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Grid frequency and voltage

Question # 15

Given the following plant conditions:

- The plant is operating at 100% power.
- RG&E Energy Control Center reports that disturbances have resulted in degraded grid frequency and voltage.
- The crew is performing AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency.
- Grid frequency is slowly lowering.
- The crew starts 'A' and "B' EDGs.

Which ONE of the following correctly identifies the **minimum** grid frequency threshold specified in the AP, below which the Safeguards Busses must be transferred to the EDG's, **AND** the method used to transfer the Safeguards Busses to the EDGs?

A. 59.5 Hz; parallel the EDG with its associated bus and then open the normal bus feeder breaker when the EDG has assumed load.

B. 59.5 Hz; open the normal bus feeder breaker and verify that the EDG output breaker has closed and the EDG is supplying the bus.

C. 58.5 Hz; parallel the EDG with its associated bus and then open the normal bus feeder breaker when the EDG has assumed load.

D. 58.5 Hz; open the normal bus feeder breaker and verify that the EDG output breaker has closed and the EDG is supplying the bus.

Answer: D

Explanation/Justification:

A. Incorrect: Frequency too high and in this condition you would not parallel the busses because of the low frequency.

B. Incorrect: Correct way to energize bus, but frequency is too high. Frequency is only at the level where EDG's are started, not connected to the bus.

C. Incorrect: Frequency is correct but method is not. Would not parallel with EDG's at this low frequency.

D. Correct.

Technical References:	AP-ELEC.2, Rev 01503, Steps 2-5
Proposed References to be provided:	None
Learning Objective:	RAP08C,1.02, 2.01
Question Source:	Bank
Question History:	Last NRC Exam Ginna 2011 SRO Retake Q43
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b)

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	W E04 EK 2.2	
	Importance	3.8	

K/A Statement: Knowledge of interrelationships between LOCA outside containment and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Question # 16

Which of the following strategies is directed by ECA-1.1, Loss of Emergency Coolant Recirculation?

1. Makeup to the RCS from the VCT
2. Blended Makeup to the RWST
3. Transfer from the SFP to the Containment Sump
4. Transfer from the CVCS HUT(S) to the RWST

A. 2 & 3 ONLY

B. 3 & 4 ONLY

C. 1, 2 & 4 ONLY

D. 1, 2, 3 & 4

Answer: C

Explanation/Justification:

A. Incorrect. This choice does not include all strategies. The strategies in ECA-1.1 are 1) SFP to RWST, 2) CVCS HUT(S) to RWST, 3) BLEND to RWST, 4) RCS Makeup from the VCT

B. Incorrect. This choice does not include all strategies. The strategies in ECA-1.1 are 1) SFP to RWST, 2) CVCS HUT(S) to RWST, 3) BLEND to RWST, 4) RCS Makeup from the VCT

C. Correct. Strategies 1, 2 & 4 are all strategies directed by ECA-1.1.

D. Incorrect. The Spent Fuel Pit is a source for the RWST. Direct sump fill sounds good but not a method used.

Technical References:	ECA 1.1, 1.2	
Proposed References to be provided:	None	
Learning Objective:	REC12C 1.04	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.4a (b) 10	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	W E11 EK 3.4	
	Importance	3.6	

K/A Statement: Knowledge of the reasons for the following responses as they apply to the (Loss of Emergency Coolant Recirculation): RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.

Question # 17

Given the following plant conditions:

- A LOCA is in progress.
- The crew has transitioned to ES-1.3, Transfer to Cold Leg Recirculation, to align for cold leg recirculation.
- RWST level is 25%.
- Containment Sump 'B' 78 inch level light is lit.

What action is required, **AND** why?

A. Remain in ES-1.3; Stop all pumps taking suction from the RWST due to loss of RWST inventory outside containment.

B. Transition to ECA 1.1 "Loss of Emergency Coolant Recirculation" due to lack of adequate NPSH for RHR pumps.

C. Remain in ES-1.3; Stop one train of redundant safeguards pumps to minimize the rate of RWST depletion.

D. Transition to ECA 1.2 "LOCA Outside Containment" to prevent pump damage due to loss of NPSH.

Answer: D

Explanation/Justification:

A. Incorrect. This is an action for inadequate RWST level.

B. Incorrect. This is an action for inadequate RWST level.

C. Incorrect. This is action if staying in ES-1.3, but low sump level requires exit.

D. Correct. The question provides parameter values indicative of a LOCA inside containment with a piping leak in the Aux Bldg. The required transition is for inadequate sump level < 113 inches.

Technical References:	ES 1.3	
Proposed References to be provided:	None	
Learning Objective:	RES13C 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	W E05 EK2.2	
	Importance	3.9	

K/A Statement: EK2.2, Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Question # 18

Given the following plant conditions:

- The plant tripped from 100% power due to a loss of all feedwater
- 'A' S/G Wide Range Level: 70 inches
- 'B' S/G Wide Range Level: 30 inches
- The crew is establishing RCS Bleed and Feed in accordance with FR-H.1, Response to Loss of Secondary Heat Sink
- The HCO attempts to OPEN both PRZR PORVs, but only one PORV opens

Select the choice that correctly completes the following statement.

In this condition, RCS bleed and feed ____(1)___ provide adequate core heat removal _____(2)
.

A. (1) will NOT
 (2) because the Pressurizer will become water solid

B. (1) will
 (2) if AT LEAST one high-head SI pump is running

C. (1) will NOT
 (2) because RCS depressurization will be insufficient

D. (1) will
 (2) ONLY if BOTH high-head SI pumps are running

Answer: C

Explanation/Justification:

A. Incorrect. Pressurizer level indication will show rising level after opening the PORV as a steam void develops in the reactor vessel head. However, this is not the reason why heat removal will be insufficient.

B. Incorrect. One SI pump will not be sufficient, even if two PORVs were available.

C. Correct. The size hole in the pressurizer established by the single PORV opening is not adequate for the required depressurization needed to allow enough injection to restore RCS minimum inventory.

D. Incorrect. Two pumps are required for adequate core cooling but they will not provide sufficient flow unless two PORVs are opened.

Technical References:	FR-H.1 and background
Proposed References to be provided:	None
Learning Objective:	RFRH1C 1.03
Question Source:	Modified Bank 1680542
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 1 G2.2.37	
	Importance	3.6	

K/A Statement: Continuous Rod Withdrawal – Ability to determine operability and/or availability of safety related equipment.

Question # 19

Given the following plant conditions:

- The plant was at 75% power during a plant startup.
- A failure of the Rod Control switch internals resulted in auto withdrawal of Control Bank D by 14 steps.
- Rod motion stopped when rods were placed in manual.

Which ONE of the following describes the operability status of the rods?

A. Control rods are inoperable due to bank misalignment from demand position

B. Control rods are inoperable due to loss of OP&OTΔT runback protection.

C. Control rods are inoperable due to failure to maintain proper sequence limits.

D. Control rods remain operable.

Answer: D

Explanation/Justification:

A. Incorrect. Rod to bank, not bank to demand, is TS

B. Incorrect. RPS, not rods

C. Incorrect. Sequence limits are still met. Plausible if applicant does not understand sequence limits.

D. Correct.

Technical References:	Technical Specification LCO 3.1.4
Proposed References to be provided:	None
Learning Objective:	R3001C 1.12
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 6,7
Comments:	

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 036 AK 2.01	
	Importance	2.9	

K/A Statement: Knowledge of the interrelations between the Fuel Handling Incidents and the following: Fuel handling equipment.

Question # 20

Given the following:

- The plant is in MODE 6.
- Fuel Off-Load is in progress.
- An assembly is removed from the core and bubbles come to the surface of the Refueling Cavity, causing Containment Radiation monitors to alarm.
- Visual inspection indicates mechanical distortion of the assembly.

Which ONE of the following describes the action to be taken in regard to the damaged assembly in accordance with RF-601, Fuel Handling Accident Instructions?

A. Insert in the nearest open fuel rack in the core and disengage the handling tool.

B. Insert in the nearest open fuel rack in the core and leave the assembly latched.

C. Position the manipulator crane over the emergency location in the transfer slot, lower to the bottom of the transfer slot, and disengage the handling tool.

D. Position the manipulator crane over the emergency location in the transfer slot, lower to the bottom of the transfer slot, and leave the assembly latched.

Answer: D

Explanation/Justification:

E. Incorrect. Condition precludes placing in an open fuel rack, and for a damaged assembly, the tool will remain engaged. For an assembly that is not distorted, this would be correct.

F. Incorrect. The assembly will remain latched but will not be placed in an open rack.

G. Incorrect. The location is correct but the assembly will remain latched. Assembly may be unlatched only if there is no physical distortion.

H. Correct IAW RF-601.

Technical References:	RF-601	
Proposed References to be provided:	None	
Learning Objective:		
Question Source:	Bank	
Question History: Q#58	Last NRC Exam	2011 Ginna SRO Retake
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 37 AK 1.02	
	Importance	3.5	

K/A Statement: Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak: Leak rate vs. pressure drop

Question # 21

The plant has been shut down due to a 1 gpm Steam Generator tube leak.

Which of the following is an action required by AP-SG.1 "Steam Generator Tube Leak" to minimize the primary to secondary leakrate?

A. Cooldown at max rate to Tsat for S/G pressure, then depress RCS below S/G pressure.

B. Reduce RCS pressure while preparing for cooldown.

C. Secure the RCP in the affected loop.

D. Raise ARV setpoint on the affected S/G.

Answer: B

Explanation/Justification:

A. Incorrect. SGTR action, not SGTL

B. Correct. SG.1 step 36

C. Incorrect. Common misconception- shutdown RCP to "avoid pumping water out the break".

D. Incorrect. SGTR action, not SGTL

Technical References:	AP-SG.1
Proposed References to be provided:	None
Learning Objective:	RAP32C 2.01
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 10
Comments:	

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	1	
	Group #	2	
	K/A #	APE 051 AA1.04	
	Importance	2.5	

K/A Statement: Ability to operate and / or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position

Question # 22

Given the following plant conditions:

- Reactor power was stable at 25%
- A loss of condenser vacuum occurred
- Condenser vacuum stabilized at 21 inches Hg in the DO NOT OPERATE region of FIG-13.0, FIGURE BACKPRESSURE
- The crew performs expected response actions in accordance with appropriate procedures

Which ONE of the following describes the final control rod position 10 minutes later, as compared to rod position prior to the event?

A. Lower (but not fully inserted)

B. Higher

C. Fully inserted

D. Approximately the same.

Answer: A

Explanation/Justification:

A. Correct. With condenser backpressure well into the do-not-operate region of Fig. 13.0, operators are required to trip the Turbine within 5 minutes in accordance with AP.TURB.4.

With the turbine tripped, reactor power will be lowered and stabilized between 1% and 2% in accordance with AP-TURB.1, Turbine Trip Without Rx Trip Required. The operators will ensure that the Rod Control system is inserting rods automatically as required and then take manual control to stabilize reactor power.

B. Incorrect. Plausible since the applicant may believe that stabilizing the reactor between 1% and 2% while compensating for the Xenon peak will result in control rods being further withdrawn than the initial control rod position.

C. Incorrect. Plausible since a Turbine trip above the P-9 Permissive (50% reactor power) would result in a reactor trip. Additionally, a Turbine trip below the P-9 Permissive but above the steam dump capacity with a loss of condenser vacuum (below 20 inches Hg) would result in a reactor trip since Steam Dumps would not be available.

D. Incorrect. Plausible since the initial power level is within the capacity of steam dumps. Applicant may think it is appropriate to stabilize power on the steam dumps at 25%.

Technical References:	Normal Transients PPT	
Proposed References to be provided:	None	
Learning Objective:	RAP23C 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 5	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 68 AK 2.03	
	Importance	2.9	

K/A Statement: Knowledge of the interrelations between the Control Room Evacuation and the following: Controllers and positioners

Question # 23

The control room has been evacuated due to a fire. ER-FIRE.1, Alternate Shutdown for Control Complex Fire, is being implemented.

Which of the following correctly completes the following statement?

ER-FIRE.1 does **NOT** provide guidance for operation of ________ from outside the Control Complex.

A. Main Steam Isolation Valves

B. Normal Pressurizer Spray Valves

C. a Charging Pump

D. a Pressurizer PORV

Answer: B

Explanation/Justification:

A. Incorrect. CR action prior to evacuation, but local operation instructions are provided.

B. Correct. RCPs are tripped prior to evacuation.

C. Incorrect. Per ER-Fire.1, all charging pumps are stopped and placed in PULL STOP prior to evacuating the control room. The safe shutdown strategy is then deenergize and strip tto

energize Bus 14 and locally start Charging Pump ‘A’. Plausible if applicant doesn't recall that charging is re-established from outside the control room.

D. Incorrect. Per ER-Fire.1, both PORV handswitches are taken to CLOSE prior to evacuating the control room. The procedure provides guidance to enable operation of a PORV from outside the control room. Plausible that applicant may not recall that guidance for operation of PORV outside the control room is provided.

Technical References:	ER-FIRE-1	
Proposed References to be provided:	None	
Learning Objective:	RER22C 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	EPE 074 EK 3.05	
	Importance	4.2	

K/A Statement: Knowledge of the reasons for the following responses as they apply to the Inadequate Core Cooling: Activating the HPI system

Question # 24

The crew is performing FR-C.1 Response to Inadequate Core Cooling.

Per FR-C.1 background document, which of the following, if available, is the most effective method of restoring level above the top of the core and achieving adequate core cooling?

A. Initiate high pressure injection with SI pumps.

B. Establish feed and bleed cooling using SI and PORVs.

C. Initiate forced core cooling using a reactor coolant pump.

D. Cooldown at maximum rate with ARVs to inject accumulators.

Answer: A

Explanation/Justification:

A. Correct.

B. Incorrect. Not a method in C.1, used in other FR-H.1

C. Incorrect. Last resort method, in C.1

D. Incorrect. Tried after HPI not available.

Technical References: FR-C.1 background.

Proposed References to be provided: None

Learning Objective:	RFRC1C 1.03
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 10
Comments:	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	W E15 EK 3.2	
	Importance	2.8	

K/A Statement: Knowledge of the reasons for the following responses as they apply to the (Containment Flooding): Normal, abnormal and emergency operating procedures associated with (Containment Flooding).

Question # 25

The crew is performing AP-SW.1 Service Water Leak, and has determined the leak is in containment. This procedure requires consideration of plant shutdown at a specific containment sump level. What is the basis for this procedural action?

A. DBA Accident analyses assume a minimum containment free volume, which will be violated if too much volume is filled with water.

B. To place the plant in a safe condition prior to wetting of the reactor vessel with Service Water.

C. DBA Accident analyses assumes a maximum dilution of SI water in the event of entry into ES-1.3, Transfer to Cold Leg Recirculation; the specified level contains that maximum dilution volume.

D. To prevent the degradation of the iodine retention capability of Containment Spray.

Answer: B

Explanation/Justification:

A. Incorrect.

B. Correct. Step 4 provides the shutdown guidance based on sump level because of concerns over wetting of the reactor vessel.

C. Incorrect.

D. Incorrect.

Technical References:	AP-SW.1 background.
Proposed References to be provided:	None
Learning Objective:	RAP19C 1.03
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	W E03 EK 2.2	
	Importance	3.7	

K/A Statement: LOCA cooldown/depress - Knowledge of the interrelations between the (LOCA Cooldown and Depressurization) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Question # 26

Given the following plant conditions:

- A small break LOCA is in progress
- All safeguards systems functioned as designed
- The crew has transitioned to ES-1.2, Post LOCA Cooldown and Depressurization
- The following current plant conditions exist:
    - o Normal Containment conditions
    - o RCS pressure stable at 700 psig
    - o RCS subcooling minus 1°F
    - o Pressurizer level 15%

(1) What cooldown rate is required; **AND**
(2) a basis for the cooldown rate per the ES-1.2 background document?

A. (1) maximum rate
   (2) to minimize inventory loss while setting RHR cooling conditions

B. (1) between 80 and 100 °F/hour
   (2) to preclude violation of thermal shock limits

C. (1) maximum rate
   (2) to avoid entry into the Functional Recovery for Integrity

D. (1) less than 25 °F/hour
   (2) to maintain coupling between S/Gs and RCS during natural circulation

Answer: B

Explanation/Justification:

A. Incorrect. Plausible reason, correct endpoint

B. Correct.

C. Incorrect. Injection may cause FR-P condition, not to be entered if subcooling lost.

D. Incorrect. Plausible because RCPs would have been secured per procedure based on plant conditions.

Technical References:	ES-1.2	
Proposed References to be provided:	None	
Learning Objective:	RES12C 1.02	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	W E08 EA 2.2	
	Importance	3.5	

K/A Statement: Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Question # 27

A steam line break event is in progress.
The faulted S/G continues to blow down.
The crew has just implemented FR-P.1, Response to Imminent Pressurized Thermal Shock.

The following conditions exist:

- Normal containment parameters
- SG NR levels off scale low
- Loop Tcold:
  - Faulted S/G loop: 300°F and lowering
  - Intact S/G loop: 350°F and lowering

Which of the following states the S/G feed strategy in accordance with FR-P.1?

A. Isolate all feed to both SGs until faulted S/G blowdown is complete.

B. Isolate feed to the faulted SG, feed intact S/G at < 100 gpm to > 7% NR.

C. Feed the faulted S/G at 50 gpm, feed intact S/G at slowest rate that will raise level.

D. Isolate feed to the faulted SG, feed intact S/G at > 200 gpm to > 7% NR.

Answer: D

Explanation/Justification:

A. Incorrect.

B. Incorrect. Plausible because ATT-22.0 provides guidance to feed at 100 gpm.

C. Incorrect. Credible because applicant could remember minimum flow requirement for ALL SGs faulted but misapply it to situation where only one SG is faulted. Applicant could rationalize that feed rate to intact SG should then be throttled to the minimum necessary to restore intact level within band to limit the cooldown rate to as low as possible while maintaining minimum requirements of 1) restoring intact level to band and 2) preventing dry out of a faulted SG. This potential misconception is supported by the guidance in ECA-2.1 for uncontrolled depress of both SGs, which directs the operator to minimize the cooldown rate by limiting feed flow to 50 gpm to each SG.

D. Correct.

Technical References:	FR-P.1	
Proposed References to be provided:	None	
Learning Objective:	RFRP1C 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	003 A3.01	
	Importance	3.3	

K/A Statement: Ability to monitor automatic operation of the RCPS, including: Seal injection flow

Question # 28

A small break LOCA has occurred. SI has automatically actuated.

Which of the following describes the expected indications for RCP seal injection and RCP seal leakoff flow?

A. Seal injection: 0 gpm; Seal leakoff: 0 gpm

B. Seal injection: 0 gpm; Seal leakoff: 3 gpm per RCP

C. Seal injection: 8 gpm per RCP; Seal leakoff: 0 gpm

D. Seal injection: 8 gpm per RCP; Seal leakoff: 3 gpm per RCP

Answer: B

Explanation/Justification:

A. Incorrect. Chg Pps trip; leakoff unaffected

B. Correct. SI trips non-essential equipment, including charging pumps. Auto SI causes CI signal, which closes Seal Return Cmnt Isol MOV 313. The inside containment seal return relief valve 314 will lift, re-directing seal leakoff flow to the PRT.

C. Incorrect. Chg Pps trip; leakoff unaffected

D. Incorrect. Chg Pps trip; leakoff unaffected

Technical References:	CVCS, RCP, ECCS PPT LPs
Proposed References to be provided:	None
Learning Objective:	R1301C 1.10
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.43 (b) 4
Comments:	

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	004 K4.08	
	Importance	2.8	

K/A Statement: Knowledge of CVCS design feature(s) and/or interlock(s) which provide for the following: Hydrogen control in RCS

Question # 29

The plant is performing a power escalation from 50% to 100% power following a refueling outage.

For the given plant condition, in accordance with S3.3B, Hydrogen Concentration Control, which of the following describes how RCS hydrogen concentration is controlled?

This procedure title was added to Question # 29 during during exam administration.

A. Inject hydrazine via the Chemical Addition Tank.

B. Adjust Volume Control Tank pressure.

C. Adjust Reactor Coolant System pressure.

D. Inject hydrogen peroxide via the Chemical Addition Tank.

Answer: B

Explanation/Justification:

A. Incorrect. Hydrazine is added for oxygen scavenging at less than 180 °F. The scavenging reaction is $N_2H_4 + O_2 \rightarrow N_2 + 2H_2O$. Plausible because hydrazine is added, hydrazine sounds like it consists of hydrogen and because chemically a hydrazine molecule is composed primarily of hydrogen atoms.

B. Correct. Hydrogen gas pressurizes the VCT gas space and the pressure determines the hydrogen concentration in solution. Raising VCT gas pressure increased the RCS hydrogen concentration.

C. Incorrect. Adjusting RCS pressure will have some small effect on amount of gas in solution but is not used as a method for hydrogen control.

D. Incorrect. Hydrogen peroxide is added during shutdown with RCS temperature less than 180 °F to initiate a crud burst prior to commencing outage work. It is not added for hydrogen control.

Technical References:	CVCS PPT LP	
Proposed References to be provided:	None	
Learning Objective:	R1601C 1.04	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.43 (b) 4	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	004 A3.02	
	Importance	3.6	

K/A Statement: Ability to monitor automatic operation of the CVCS, including: Letdown isolation.

Question # 30

Given the following plant conditions:

- An RCS leak is in progress
- Pressurizer level is lowering

At what Pressurizer level will letdown isolation occur, **AND** which of the following valves will close?

NOTE: AOV-427, Isolation AOV to the Regenerative HX
AOV-200A, -200B, -202, Letdown Orifice valves

A. PZR level 20%;
AOV-427 **ONLY**

B. PZR level 20%;
AOV-427 **AND** AOV-200A, AOV-200B, AOV-202

C. PZR level 13%;
AOV-427 **ONLY**

D. PZR level 13%;
AOV-427 **AND** AOV-200A, AOV-200B, AOV-202

Answer: D

Explanation/Justification:

A. Incorrect.

B. Incorrect.

C. Incorrect.

D. Correct. The lower end of the pressurizer normal level control band is 20% pressurizer level. Letdown Isolation AOV-427 automatically closes on a pressurizer low level signal at 13% pressurizer level. Letdown Orifice Isolation Valves AOV-200A, B, and C automatically close on a close signal to AOV-427

Technical References:	R1601C CVCS PPT	
Proposed References to be provided:	None	
Learning Objective:		
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	
Comments:		

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	005 (SF4P RHR) K6.03	
	Importance	2.5	

K/A Statement: Residual Heat Removal: Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger

Question # 31

Given the following initial plant conditions:

- Reactor is in MODE 5
- RCS temperature is 175 °F and stable
- RCS pressure is 300 psig and stable
- RHR is operating in AUTOMATIC in accordance with O-2.2, Plant Shutdown from Hot Shutdown to Cold Conditions
- 'A' RHR pump and heat exchanger are in service and aligned to the RCS
- 'B' RHR train is secured
- RHR flow rate is 1500 gpm and stable

Subsequently, CCW Surge tank level and CCW radiation level both begin to rise. Based on these indications, the operator calculates a 100 gpm leak rate and concludes the leak is in the 'A' RHR Heat Exchanger.

The operator can determine that RHR system response is consistent with the diagnosed leak location by verifying which of the following automatic plant responses? (Assume no operator action)

NOTE: HCV-625, 'A' RHR HX Outlet FCV
HCV-626, RHR HX Bypass FCV

A. HCV-625 closes slightly.
HCV-626 position does **NOT** change.

B. HCV-625 opens slightly.
HCV-626 closes slightly.

C. HCV-625 position does **NOT** change.
HCV-626 opens slightly.

D. HCV-625 position does **NOT** change.
HCV-626 closes slightly.

Answer: C

Explanation/Justification:

A. Incorrect, See C

B. Incorrect, See C

C. Correct. HCV-625 is a manually controlled valve. HCV-626 adjusts heat exchanger bypass flow to maintain total RHR return flow at its controller setpoint. The controller will sense a lower total RHR return flow rate due to some RHR exiting through the heat exchanger leak. The controller for HCV-626 will open the valve slightly to restore measured total RHR return flow to the controller setpoint of 1500 gpm.

D. Incorrect, HCV-625 position does not change but HCV-626 throttles open, not closed.

Technical References:	R2501C	
Proposed References to be provided:	None	
Learning Objective:	R2501C 1.10	
Question Source:	Bank: Point Beach 2012	
Question History:	Last NRC Exam	Point Beach 2012
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:		
Comments:		

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	006 A 1.14	
	Importance	3.6	

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

Question # 32

Given the following plant conditions:

- The crew is responding to a LOCA and is performing SI flow reduction steps in ES-1.2, Post LOCA Cooldown and Depressurization
- Adverse containment conditions exist
- RCPs are stopped
- The crew has just stopped the second SI pump, leaving one SI pump running
- Pressurizer level is 35% and rising
- RCS subcooling is minus 5° F and slowly trending more negative

For the given conditions, what is the expected behavior of RVLIS **AND** what is expected regarding operation of the SI pumps in accordance with ES-1.2?

A. RVLIS will be trending up.
Start SI pumps as necessary.

B. RVLIS will be trending up.
Do NOT start SI pumps unless PZR level cannot be maintained greater than 10% [30% adverse CNMT].

C. RVLIS will be trending down.
Start SI pumps as necessary.

D. RVLIS will be trending down.
Do NOT start SI pumps unless PZR level cannot be maintained greater than 10% [30% adverse CNMT].

Answer: C

Explanation/Justification:

A. Incorrect. Part 1 is wrong. Conditions indicate void formation in the reactor vessel head area. RVLIS will be trending down. Part 2 is correct. The foldout page SI reinitiation is met based on the criterion of less than 0°F RCS subcooling.

B. Part 1 is wrong. Conditions indicate void formation in the reactor vessel head area. RVLIS will be trending down. Part 2 is wrong. With foldout page SI reinitiation met, SI pumps should be started as necessary.

C. Correct. Part 1 is correct. Conditions indicate void formation in the reactor vessel head area. RVLIS will be trending down. Part 2 is correct. The foldout page SI reinitiation is met based on the criterion of less than 0°F RCS subcooling

D. Incorrect. Part 1 is correct. Conditions indicate void formation in the reactor vessel head area. RVLIS will be trending down. Part 2 is wrong. With foldout page SI reinitiation met, SI pumps should be started as necessary.

Technical References:	ES-1.2	
Proposed References to be provided:	None	
Learning Objective:	R6701C 1.09; RES12C 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	007 K5.02	
	Importance	3.1	

K/A Statement: Pressurizer Relief/Quench Tank: Knowledge of the operational implications of the following concepts as they apply to PRTS: Method of forming a steam bubble in the PZR

Question # 33

Given the following plant conditions:

- O-1.1, Plant Heatup from Cold Shutdown to Hot Shutdown, is in progress
- RCS Fill and Vent using O-1A, Filling and Venting the Reactor Coolant System, is complete
- Preparations for drawing a bubble in the Pressurizer are being made

Which one of the following describes the current condition of the PRT in accordance with O-1.1, prior to raising RCS pressure and heating up the pressurizer to draw a steam bubble?

A. Filled between 30% and 50% and vented to atmosphere via a vent hose to prevent overpressurization if the PORVs lift.

B. Filled between 30% and 50% and pressurized with Nitrogen to prevent an explosive Hydrogen-Oxygen mixture if the PORVs lift.

C. Filled between 61% and 84% and vented to atmosphere via a vent hose to prevent overpressurization if the PORVs lift.

D. Filled between 61% and 84% and pressurized with Nitrogen to prevent an explosive Hydrogen-Oxygen mixture if the PORVs lift.

Answer: D

Explanation/Justification:

A. Incorrect. Level is below normal band, vent path is required to be shut. This would be the lineup for filling and venting the pressurizer when going solid.

B. Incorrect. Level is below normal band.

C. Incorrect. Level is correct but vent condition is incorrect. This would be the lineup for filling and venting the pressurizer when going solid.

D. Correct. Per O-1.1, PRT level is adjusted to within a band of greater than or equal to 61% AND less than or equal to 84%. PRT pressure is adjusted to within band with nitrogen.

Technical References:	O-1.1, Rev 170 (Step 6.1.6)	
Proposed References to be provided:	None	
Learning Objective:	ROP00C 1.05	
Question Source:	Bank	
Question History:	Last NRC Exam	Ginna 2006
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 7 55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	007 A1.02	
	Importance	2.7	

K/A Statement: Pressurizer Relief/Quench Tank: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Maintaining quench tank pressure

Question # 34

Given the following plant conditions:

- The reactor is operating at 100% power
- Annunciator F-9, PRT HI PRESS 5 PSI is lit.

The following are indications for the PRT:

- PRT pressure: 6.0 PSIG and RISING SLOWLY
- PRT temperature: 115˚F
- PRT level: 62% and STABLE

If PRT pressure rise is allowed to continue,

The PRT rupture disc will discharge to containment when pressure in the PRT rises to __(1)
AND the operator must _____(2)____ to restore normal PRT conditions.

A. (1) 50 psig
   (2) vent the PRT

B. (1) 50 psig
   (2) drain the PRT to the 'A' Sump

C. (1) 100 psig
   (2) drain the PRT to the 'A' Sump

D. (1) 100 psig

(2) vent the PRT

Answer: D

Explanation/Justification:

A. Incorrect. Wrong setpoint, correct action.

B. Incorrect. Wrong setpoint, wrong action (PRT drain is directed to RCDT, not the sump).

C. Incorrect. Correct setpoint, wrong action (PRT drain is directed to RCDT, not the sump).

D. Correct. Per AR-F-9, PRT pressure may be lowered by the draining method in step 4.3 or the venting method in step 4.4. Venting is correct action in this case to prevent bringing in low level alarm at 60.8%.

Technical References:	AR-F-9
Proposed References to be provided:	None
Learning Objective:	R1401C 1.07, 1.11
Question Source:	Bank
Question History:	Last NRC Exam: Ginna 2010
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7 55.41 (b) 10

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	008 K4.01	
	Importance	3.1	

K/A Statement: Component Cooling Water: Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: Automatic start of standby pump

Question # 35

Given the following plant conditions:

- Plant is at 100%, with a 50/50 normal electrical alignment
- "B" CCW pump is in service

Subsequently, the following occurs:

- Off-site power circuit 767 trips
- The associated Emergency Diesel Generator fails to start

With no operator action, CCW ___(1)___ will be running with ___(2)___ CCW Pump breaker(s) red indicating light(s) lit on the MCB.

	(1)	(2)
A.	Pump "A"	**ONLY** "A"
B.	Pump "A"	"A" **AND** "B"
C.	Pump "B"	**ONLY** "B"
D.	Pump "B"	"A" **AND** "B"

Answer: B

Explanation/Justification:

A. Incorrect. Part 1 is correct, but Part 2 is wrong. The red breaker indicating light for CCW Pump A will illuminate when the pump automatically starts following the loss of power to Bus

16 – the power source for CCW Pump B. The red light breaker indicating light for CCW Pump B will remain illuminated when Bus 16 de-energizes because there is no UV load shed trip on the CCW pump breaker.

B. Correct. In the 50/50 electrical alignment, the loss of Circuit 767 and "B" DG failure to start will result in no power to Bus 16, which powers the "B" CCW pump. The "A" CCW pump still has off-site power available, and will start automatically as soon as CCW system pressure lowers to 50 psig. When the "A" CCW pump starts, its associated breaker red indicating light will light. Although the "B" CCW pump has no power, its breaker is still closed, and therefore its red light is still lit. There are no UV trips for the CCW pumps.

C. Incorrect. Part 1 is wrong and Part 2 is wrong. The red breaker indicating light for CCW Pump A will illuminate when the pump automatically starts following the loss of power to Bus 16 – the power source for CCW Pump B. The red light breaker indicating light for CCW Pump B will remain illuminated when Bus 16 de-energizes because there is no UV load shed trip on the CCW pump breaker.

D. Incorrect. Part 1 is wrong, but Part 2 is correct. The red breaker indicating light for CCW Pump A will illuminate when the pump automatically starts following the loss of power to Bus 16 – the power source for CCW Pump B. The red light breaker indicating light for CCW Pump B will remain illuminated when Bus 16 de-energizes because there is no UV load shed trip on the CCW pump breaker.

Technical References:
R2801C LP,
O-6.9.2 Rev 024, Section 6.5 (shows 767 feed to Train B Safety Bus 16)
AP-ELEC.14/16 Rev 01203 Steps 7 and 8 (lists major loads on Buses 14 and 16)

Proposed References to be provided:	None
Learning Objective:	R0701C 1.06, R2801C 1.07
Question Source:	Bank
Question History:	Last NRC Exam 2012
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	010 K6.04	
	Importance	2.9	

K/A Statement: PZR Press Control – Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: PRT

Question # 36

Given the following plant conditions:

- PRT pressure has been rising.
- Leakage into the PRT has been quantified at 9 gpm.
- Changing PRT conditions are due to a Pressurizer Safety Valve leak.
- Containment pressure is 0.2 psig and stable.

Which ONE of the following correctly completes the following statement?

The safety valve leakage is ______(1)______ the limit of TS LCO 3.4.13, RCS Operational Leakage **AND**, if the pressure rise causes the PRT rupture disc to rupture, the subsequent relief line tailpipe temperature will be _____(2)_____ the tailpipe temperature immediately prior to the disc rupture.

A. 1) IDENTIFIED leakage, within
   2) the same as

B. 1) PRESSURE BOUNDARY leakage, in excess of
   2) the same as

C. 1) IDENTIFIED leakage, within
   2) lower than

D. 1) PRESSURE BOUNDARY leakage, in excess of
   2) lower than

Answer: C

Explanation/Justification:
<u>General Discussion:</u>
Assume an RCS pressure of 2085 psig ≈ 2100 psia. The enthalpy of saturated steam at 2100 psia ≈ 1130 BTU/lbm (precisely 1128.7 BTU/lbm).

Following the constant enthalpy line on the Mollier diagram to the constant pressure line of 80 psia (65 psig), and then following that constant pressure line up to the saturation curve yields a temperature of approximately 310°F.

Following the constant enthalpy line to the "Standard Atmosphere" pressure line (≈ 15 psia or 0 psig), and then following that constant pressure line up to the Saturation Curve, yields a temperature of approximately 210°F.

This example illustrates how the tailpipe temperature, downstream of the relief valve, will be lower following the rupture of the rupture disc.

A. Incorrect. Part 1 is correct. Part is incorrect but plausible if the applicant does not understand how the isenthalpic expansion of the steam through the relief to a reduced PRT pressure will result in a lower tailpipe temperature.

B. Incorrect. Part 1 is incorrect but plausible if the applicant does not understand the Tech Spec definition of pressure boundary leakage. Part 2 is incorrect but plausible if the applicant does not understand how the isenthalpic expansion of the steam through the relief to a reduced PRT pressure will result in a lower tailpipe temperature.

C. Correct. Part 1: The leakage meets the TS definition of IDENTIFED LEAKAGE, and TS 3.4.13 LCO sets a limit of 10 gpm for this type of leakage, which is above the leak rate that is given. This is TS knowledge expected of a RO applicant. IDENTIFIED leakage is defined in TS Section 1.1 as "*LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE*". PRESSURE BOUNDARY LEAKAGE is defined as " *LEAKAGE (except primary to secondary LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall* " Part 2 is correct because, as explained in the general discussion above, the isenthalpic expansion to a new lower pressure will result is a lower tailpipe temperature.

D. Incorrect. Part 1 is incorrect but plausible if the applicant does not understand the Tech Spec definition of pressure boundary leakage. Part 2 is correct.

Technical References: 2000 ASME Steam Tables
TS Definitions (Section 1.1) and TS 3.4.13

Proposed References to be provided:	None	
Learning Objective:	R1401C 1.10a	
Question Source:	Modified Bank	
Question History:	Last NRC Exam	2017 McGuire Q#10
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 14	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	010 G2.2.38	
	Importance	3.6	

K/A Statement: Pressurizer Pressure Control: Knowledge of conditions and limitations in the facility license.

Question # 37

Given the following plant conditions:

- The RCS is at 350°F, going solid in accordance with O-2.2, Plant Shutdown from Hot Shutdown to Cold Conditions.
- The operators become distracted by reports of a fire in the Turbine Building.
- As a result of the passive failure of several overpressure protection components coupled with the distraction, RCS pressure rises and stabilizes at 2800 psig before operators respond.

Select the choice which correctly completes the following statement:

In accordance with the most time limiting applicable Technical Specification requirement, pressure must be reduced to restore compliance __________.

A. immediately

B. within 5 minutes

C. within 30 minutes

D. within 60 minutes

Answer: B

Explanation/Justification:

A. Incorrect. Plausible because many TS require immediate response.

B. Correct. To comply with RCS Pressure Safety Limit in Modes 3, 4 and 5 (which is the most limiting of applicable Tech Specs) requires compliance within 5 minutes.

C. Incorrect. Plausible because this is the correct time for compliance with TS LCO 3.4.3 RCS P/T Limits.

D. Incorrect. Plausible because this is the correct answer for compliance with RCS Pressure SL 2.1.2 when in Modes 1 or 2.

Technical References:	Technical Specification LCO 2.2
Proposed References to be provided:	None
Learning Objective:	RTS00C 2.02
Question Source:	Bank
Question History:	Last NRC Exam 2012
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 5

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	012 A4.01	
	Importance	4.5	

K/A Statement: Reactor Protection: Ability to manually operate and/or monitor in the control room: Manual trip button

Question # 38

Given the following plant conditions:

- A plant startup is in progress with power at 5%
- The UV trip coil for Reactor Trip Breaker (RTB) 'A' has failed in its current position and, if called upon, will not function to trip the RTB

Then, an inadvertent zirconium guide tube reactor trip signal occurred.

Select the choice which correctly completes the following statement.

The reactor ________________ .

A. must be tripped by depressing **EITHER** the manual reactor trip pushbutton **OR** the local 'A' RTB trip pushbutton

B. must be tripped by depressing the manual reactor trip pushbutton since the local 'A' RTB trip pushbutton will **NOT** function

C. automatically tripped when 'A' RTB did **NOT** open and 'B' RTB opened due to UV coil operation **ONLY**

D. automatically tripped when 'A' RTB opened on shunt coil operation and "B' RTB opened due to operation of **BOTH** the shunt **AND** UV coils

Answer: C

Explanation/Justification:

A. Incorrect. The reactor will automatically trip on opening of the 'B' RTB.

B. Incorrect. The local trip pushbutton for RTB “A” will work.

C. Correct. The zirconium guide tube trip is unique in that it utilizes the UV trip coil only. With the ‘A’ RTB UV coil failed in its current position, the zirconium guide tube trip signal will not trip the ‘A’ RTB. Depressing the manual reactor trip pushbutton energizes both the ‘A’ and ‘B’ RTB shunt coils, which will open both breakers. The ‘A’ RTB can also be opened by depressing the local trip button at the breaker. The zirconium guide tube trip is enabled only when power is below P-7 setpoint (8%).The 'A' RTB will not receive a shunt trip on the auto reactor trip, however the 'B' RTB will trip on its shunt coil, resulting in an automatic reactor trip.

D. Incorrect. The “A” RTB did not open and the “B” RTB only received a UV trip.

Technical References:	R3501C LP TS 3.3.1 Bases (page B3.3.1-8)
Proposed References to be provided:	None
Learning Objective:	R3501C 1.07
Question Source:	Bank
Question History:	Last NRC Exam 2012
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	013 K5.02	
	Importance	2.9	

K/A Statement: Engineered Safety Features Actuation: Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability

Question # 39

A plant heatup was in progress per O-1.1, Plant Heatup from Cold Shutdown to Hot Shutdown. The following RCS conditions existed:

- RCS temperature 375°F
- RCS pressure 850 psig

An electrical malfunction resulted in the "A" train SI block switch failing to the "BLOCK" position.

The heatup has continued and current RCS conditions are:

- RCS temperature 530°F
- RCS pressure 2100 psig

Select the choice that correctly completes the following statement to describe the expected current state of the 'A' Train SI actuation blocks.

Given the block switch failure described above, at current plant conditions the PRZR Auto SI ___(1)___ blocked **AND** the SG Auto SI ___(2)___ blocked.

A. (1) IS
(2) IS

B. (1) IS
(2) IS NOT

C. (1) IS NOT
(2) IS

D. (1) IS NOT
(2) IS NOT

Answer: D

Explanation/Justification:

A. Incorrect. PRZR Auto SI is not blocked. SG Auto SI is not blocked.

B. Incorrect. PRZR Auto SI is not blocked. SG Auto SI is not blocked.

C. Incorrect. PRZR Auto SI is not blocked. SG Auto SI is not blocked.

D. Correct. The PRZR Auto SI is NOT blocked. The SG Auto SI is NOT blocked. On a normal plant cooldown, 2 of 3 PRZR pressure channels below 1992 psig will enable manual SI block of the PRZR and S/G SI signals. The block switch is momentary in the circuit but, once blocked, the block circuit seals in and maintains the blocks unless or until the 2 of 3 PRZR pressure channels below 1992 psig condition is no longer met. If RCS pressure rises such that the low pressure block enable is lost, then the block will be removed. The block switch failed in the block position only provides one of the two necessary signal to cause the SI to be blocked. So the switch failure will not prevent the automatic removal of the SI block on increasing RCS pressure.

Technical References:	P-1, SI Big Notes, Print 33013-1353 Sheet 6
Proposed References to be provided:	None
Learning Objective:	R2701C 1.07
Question Source:	Modified Bank
Question History:	Last NRC Exam
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	022 A4.01	
	Importance	3.6	

K/A Statement: Containment Cooling: Ability to manually operate and/or monitor in the control room: CCS fans

Question # 40

Given the following plant conditions:

- A LOCA is in progress
- Automatic Reactor trip and Safety Injection actuation have occurred
- HCO is performing ATT-27.0, Automatic Action Verification, Step 2, Verify CNMT RECIRC Fans Running

Which choice correctly completes the following statements?

1) The Charcoal Filter Damper status lights will be verified ___(1)___.

2) If the Charcoal Filter Damper status lights do not reposition, the operator will ___(2)___ in the Relay Room.

A. (1) extinguished
(2) remove damper solenoid fuses

B. (1) extinguished
(2) depress trip relay plungers

C. (1) NOT extinguished
(2) remove damper solenoid fuses

D. (1) NOT extinguished
(2) depress trip relay plungers

Answer: B

Explanation/Justification:

A. Incorrect. Part 1 is wrong and Part 2 is correct. Plausible because part 1 is correct and the applicant may think that ATT-27.0 directs removal of the solenoid power supply fuses to reposition the charcoal filter dampers.

B. Correct. In accordance with ATT-27.0, Step 2.b, the operator is directed to "Verify Charcoal filter dampers green status lights – EXTINGUISHED". In accordance with ATT-27.0, Step 2.b. RNO, if the charcoal filter dampers' green status lights are not extinguished, the operator is directed to push in the trip relay plungers located in the Relay Room.

C. Incorrect. Part 1 is plausible because the applicant may not recall whether the light should be extinguished or not extinguished. Part 2 is plausible since the applicant may believe that ATT-27.0 directs removal of the solenoid power supply fuses to reposition the charcoal filter dampers.

D. Incorrect. Part 1 is wrong and Part 2 is correct. Part 2 is plausible since the applicant may believe that ATT-27.0 directs removal of the solenoid power supply fuses to reposition the charcoal filter dampers.

Technical References:	ATT-27.0, Step 2.b	
Proposed References to be provided:	None	
Learning Objective:	R2401C 1.05, R2201C 1.06	
Question Source:	Modified Bank	
Question History:	Last NRC Exam	Ginna 2012 RO Retake
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 5	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	026 K3.01	
	Importance	3.9	

K/A Statement: Knowledge of the effect that a loss or malfunction of the CSS [CONTAINMENT SPRAY SYSTEM] will have on the following: CCS [CONTAINMENT COOLING SYSTEM]

Question # 41

The plant has experienced a LOCA, followed by an automatic SI initiation and containment spray actuation. The following conditions exist:

- "A" Containment Spray Pump is out of service for breaker maintenance
- Containment pressure is 40 psig
- Annunciator L-5, SAFEGUARD BUS MAIN BREAKER OVERCURRENT TRIP, is lit
- The normal supply breaker to Bus 16 opened and Bus 16 is de-energized
- "B" Emergency Diesel Generator failed to automatically start
- "C" Service Water Pump failed to automatically start

Which ONE of the choices below correctly completes the following statement?

_________________ must be started/restored to ensure containment peak design pressure and temperature limits will be met.

A. "A" Containment Spray Pump

B. "B" Emergency Diesel Generator

C. "C" Service Water Pump

D. NO additional component

Answer: A

Explanation/Justification:

A. Correct: With 'A' CNMT Spray Pump out for maintenance and Bus 16 de-energized (CRFC 'B' &'C'), no CNMT Spray Pumps are operating and only 2 CRFCs are operating. Adequate CNMT cooling requires a minimum of 1 CS pump and 2 CRCFs. EDGs can't power up Bus 16 due to the unknown bus fault. Need to restore either Bus 16 or the 'A' CNMT Spray Pump.

B. Incorrect: Plausible because although the actions seem conservative, the root information identifies that there is an unknown bus fault on Bus 16 (which would prevent the EDG output breaker for Bus 16 from closing in on the bus).

C. Incorrect: Plausible because applicant may believe starting additional SW cooling flow will remedy the cooling problem by providing additional cooling to the running CRFC units, when in fact the minimum equipment requirements cannot be met.

D. Incorrect: See below. Plausible because applicant may think containment pressure will peak within limits and then maintain based on having 2 CRFC units in service.

Technical References:	ITS 3.6.6 basis
Proposed References to be provided:	None
Learning Objective:	R2401C 1.01
Question Source:	Modified Bank
Question History:	Last NRC Exam Ginna 2012 Q#35
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7
Comments:	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	026 A2.08	
	Importance	3.2	

K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Safe securing of containment spray when it can be done)

Question # 42

Given the following plant conditions:

- A LOCA has occurred.
- The crew performed E-0, Reactor Trip or Safety Injection, and E-1, Loss of Reactor or Secondary Coolant.
- The crew has transitioned to ES-1.1, SI Termination.

Which of the following describes an ES-1.1 threshold criterion for stopping containment spray pumps?

A. When containment pressure is below the CS actuation setpoint.

B. When entry is required into ES-1.3, Transfer to Cold Leg Recirculation.

C. When containment pressure is below the adverse containment value.

D. When all CRFC units are in service with containment pressure lowering..

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because it is reasonable to assume containment spray is no longer required below the CS actuation setpoint.

B. Incorrect. Plausible because RWST inventory is a concern.

C. Correct. ES-1.1 criteria is 4 psig, which is the adverse containment value

D. Incorrect. In E-1, may go down to 1 CS pump at step 13 with this condition.

Technical References:	E0, E1, ES-1.1	
Proposed References to be provided:	None	
Learning Objective:	RES11C 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	039 A4.04	
	Importance	3.8	

K/A Statement: Main and Reheat Steam: Ability to manually operate and/or monitor in the control room: Emergency feedwater pump turbines

Question # 43

Given the following plant conditions:

- Reactor tripped from 100% power
- CO is throttling closed TDAFW Pump Discharge Flow Control valves, AOV-4297 and AOV-4298, when the following Annunciator is received:
    - o H-10, AUXILIARY FEED PUMP LIGHT LOAD

Which ONE of the following describes the TDAFW Pump condition at the time the alarm is received?

A. TDAFW discharge pressure has reached 1350 psig.

B. TDAFW discharge pressure has reached 1085 psig.

C. TDAFW discharge flow has reached 100 gpm.

D. TDAFW discharge flow has reached 80 gpm.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible since this used to be the recirc valve setpoint for the MDAFW Pumps prior to modifying to a flow setpoint and the applicant may believe that the TDAFW Pump Recirc Valve is still controlled utilizing a pressure setpoint.

B. Incorrect. Plausible since this is the design pressure of the TDAFW Pump and the first S/G Safety Valve setpoint.

C. Correct. In accordance with AR-H-10, "*Auxiliary Feedwater Pump recirc valves open on the following. Annunciator input is from valve position, not system flow: TDAFW Pump – 100 gpm (FT-2032)*".

D. Incorrect. Plausible since this is the setpoint for the MDAFW Pump Recirc Valve.

Technical References:	AR-H-10	
Proposed References to be provided:	None	
Learning Objective:	R4201C 1.07e	
Question Source:	Bank	
Question History:	Last NRC Exam	2007
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 7	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	039 G2.4.45	
	Importance	4.1	

K/A Statement: Main and Reheat Steam: Ability to prioritize and interpret the significance of each annunciator or alarm

Question # 44

Given the following plant conditions:

At 10:00, plant conditions are as follows:

- MODE 3, cooling down per O-2.2, Plant Shutdown from Hot Shutdown to Cold Conditions
- RCS T_{AVG} is 495°F and stable
- RCS Pressure is 1750 psig and stable
- Both Steam Generator pressures are 640 psig and stable

At 10:20, a steam line break occurs on the “A” S/G main steam line inside containment resulting in the following indications:

- Containment pressure is 10 psig and rising
- RCS pressure is 1150 psig and lowering
- “A” S/G pressure is 400 psig and lowering
- “B” S/G pressure is 460 psig and lowering
- Annunciator G-26, S/G A HI STEAM FLOW is lit
- Annunciator G-31, S/G B HI STEAM FLOW is NOT lit

Which of the following describes the expected position of AOV-3517 “A” Main Steam Isolation Valve, **AND** why?

A. OPEN, the valve will automatically close when containment pressure rises to 18 psig.

B. CLOSED, the valve will have automatically closed when “A” S/G pressure reached 545 psig.

C. OPEN, the valve will not automatically close due to the SI block, it must be manually closed.

D. CLOSED, the valve will have automatically closed on the “A” S/G steam flow HIGH and Low TAVG coincident with a SI signal

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because the answer is correct if the valve was not closed earlier by another isolation signal.

B. Incorrect. Plausible because the answer is similar to the value for Low T_{AVG}

C. Incorrect. Plausible if the applicant does not think conditions have been met for auto isolation.

D. Correct. MSIV shuts on SI signal with high steam flow & Low T_{AVG}

Technical References:	P-1	
Proposed References to be provided:	None	
Learning Objective:	R4001C 1.07	
Question Source:	Modified	
Question History:	Last NRC Exam	Point Beach 2015
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 7	

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	059 K4.08	
	Importance	2.5	

K/A Statement: Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following: Feedwater regulatory valve operation (on basis of steam flow, feed flow mismatch)

Question # 45

The plant is at 100% power when instruments malfunction.

Given the following alarm:

- Annunciator G-20 ADFCS SYSTEM TRANSFER TO MANUAL CONTROL

WHICH ONE of the following correctly describes
(1) the combination of instrument failures that would actuate the alarm; **AND**
(2) the expected FRV response to those instruments failing?

A. (1) Two 'A' S/G pressure instruments fail,
(2) ONLY 'A' FRV shifts to MANUAL

B. (1) Two 'A' loop feed flow instruments fail;
(2) ONLY 'A' FRV shifts to MANUAL

C. (1) Two 'A' S/G pressure instruments fail;
(2) BOTH 'A' AND 'B' FRVs shift to MANUAL

D. (1) Two 'A' loop feed flow instruments fail;
(2) BOTH 'A' AND 'B' FRVs shift to MANUAL

Answer: D

Explanation/Justification:

A. Incorrect: Per AR-G-20 the setpoint for S/G pressure instruments is 2 or 3 instruments fail in both loops. Therefore AR-G-20 alarm will not come in. Plausible because G-19 would still come in since steam flow is compensated by steam pressure.

B. Incorrect: Per AR-G-20 if 2 or 3 instruments fail in a feed loop then both loop feed regulating valves shift to manual. Therefore wrong because the B loop would also shift to manual.

C. Incorrect: Per AR-G-20 the setpoint for S/G pressure instruments is 2 or 3 instruments fail in both loops. Therefore G-20 alarm will not come in. Plausible because G-19 would still come in since steam flow is compensated by steam pressure

D Correct: Per AR-G-20 if 2 or 3 instruments fail in a feed loop then both loop feed regulating valves shift to manual.

Technical References:	AR-G-19 and 20
Proposed References to be provided:	None
Learning Objective:	R4401C 1.07
Question Source:	New
Question History:	Last NRC Exam: NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 7
Comments:	

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	1	
	K/A #	061 K2.02	
	Importance	3.7	

K/A Statement: Auxiliary/Emergency Feedwater - Knowledge of bus power supplies to the following: AFW electric drive pumps.

Question # 46

The plant has been operating at 100% power and "B" Motor Driven Auxiliary Feedwater Pump was tagged out of service for motor inspection 24 hours ago.

A spurious Train "B" Safety Injection Actuation Signal occurs. Immediately thereafter, annunciator L-28, 12B XFMR OR 12B BUS TROUBLE, actuates (86T/12B LOCKOUT).

Assuming no operator actions, WHICH of the following choices correctly describes the status of the motor driven and standby auxiliary feedwater pumps two minutes later?

A. No Motor-Driven or Standby Auxiliary Feedwater Pump is running.

B. Only "A" Motor-Driven Auxiliary Feedwater Pump is running.

C. Only "A" Motor-Driven and "D" Standby Auxiliary Feedwater Pumps are running.

D. Only "D" Standby Auxiliary Feedwater Pump is running.

Answer: B

Explanation/Justification:

B. Correct. Given the conditions in the stem, even though both 14 and 16 480V Buses are energized (Bus 16 is powered from EDG B and Bus 14 is powered from 4160V Bus 12A), only the "A" MDAFW Pump will be running due to the S/G shrinkage and MFWP breakers opening on an SI signal. The applicants need to know what buses are energized and, that although D SAFW pumps may be aligned to Bus 16 because the B MDAFWP is OOS, SAFW pumps will not automatically start on an SI signal.

A. Incorrect. The "A" MDAFW Pump will be running because it will receive start signals (SG shrinkage and MFWP breakers open) and have power. Plausible because the applicants may confuse which 4160V bus powers which 480V bus in which case they could think that there is no power to "A" Train 480V bus and thus the "A" MDAFWP will not be running. Also, the applicants could think that the "A" MDAFWP is not running because there was no Train A SI signal. Therefore, with "B" MDAFWP OOS, and the fact that the SAFWPs must be manually started, the applicants could think that no AFW pumps are running.

C. Incorrect. Only the "A" MDAFW Pump will be running because it will receive start signals (SG shrinkage and MFWP breakers open) and have power. Plausible because the applicants may wrongly believe that the "D" SAFWP would be aligned to Bus 16 (since the "B" MDAFWP is OOS) and would automatically start. The SAFWPs do not start on an SI signal and would need to be started manually.

D. Incorrect. Only the "A" MDAFW Pump will be running because it will receive start signals (SG shrinkage and MFWP breakers open) and have power. Plausible because the applicants may wrongly believe that the "D" SAFWP would automatically start on an SI signal. Furthermore, applicants may wrongly believe that only Train "B" components would start on a Train "B" SI signal (thus "A" MDAFWP would not start).

Technical References:	BIG NOTES: AFW-01, AFW-02, & 480V-01 AP-ELEC.14/16, LOSS OF SAFEGUARDS BUS 14/16 AP-ELEC.1, LOSS OF 12A AND/OR 12B BUSSES
Proposed References to be provided:	R0701C 1.06 R4201C 1.05
Learning Objective:	Lesson ID: R07010C Rev27
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	061 K3.02	
	Importance	4.2	

K/A Statement: Auxiliary/Emergency Feedwater - Knowledge of the effect that a loss or malfunction of the AFW will have on the following: S/G

Question # 47

The following plant conditions exist:

- A SGTR has occurred.
- Crew has transitioned to E-3, Steam Generator Tube Rupture.
- SI has been terminated.
- While performing a plant cooldown, the ruptured S/G level lowers due to inability to fully isolate the ruptured S/G.
- Attempts to establish AFW to the ruptured S/G have not been successful.
- Ruptured S/G level has lowered below the narrow range scale.

Per the E-3 background document, if ruptured S/G Wide Range level continued to lower to approximately 250 inches, the plant may experience a ...

A. Potential reinitiation of safety injection

B. Loss of reactor coolant heat sink

C. Dilution of the reactor coolant system

D. Thermal shock of steam generator tubes

Answer: A

Explanation/Justification:

A. Correct. After the RCS cooldown, if the steam space in the ruptured steam generator expands to contact these colder tubes, condensation will occur which would decrease the ruptured steam generator pressure. This in turn would reduce the reactor coolant subcooling margin and/or increase primary-to-secondary leakage, possibly delaying SI termination or causing SI reinitiation.

B. Incorrect. Wrong because loss of heat sink is not a concern because AFW flow was only lost to the ruptured SG. (It is implied that AFW is still available to the other SG.) Plausible because loss of AFW flow can lead to the loss of heat sink but both SGs would have to lose AFW flow.

C. Incorrect. Wrong because if the steam space in the S/G collapses when exposed to the colder tubes, then pressure will drop in the S/G and RCS will flow into the SG. Plausible because the applicant may assume that the S/G pressure control would be lost if level continues to lower and therefore may cause S/G inventory to flow into the RCS

D. Incorrect. Wrong because nothing is stated in the question indicating that the conditions for a hot dry S/G exist. Plausible because shocking the S/G tubes is a concern for hot dry SGs. It is possible that the applicant may confuse the bases information between a SGTR and loss of heat sink.

Technical References:	E-3 Background Document page 73-74	
Proposed References to be provided:	None	
Learning Objective:	REP03C 1.03	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 7 55.41 (a) 6	

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	062 K2.01	
	Importance	3.3	

K/A Statement: AC Electrical Distribution – Knowledge of bus power supplies to the following: Major system loads

Question # 48

Reactor power was lowered to 85% power while mechanics replace bearings on Condensate Booster Pump 1C.

WHICH 4160V Bus loss will require the crew to implement AP-TURB.5, Rapid Load Reduction?

A. Bus 11 A

B Bus 11 B

C. Bus 12 A

D. Bus 12 B

Answer: C

Explanation/Justification:

C. Correct. With 1C Condensate Booster Pump OOS at 85%, the other two condensate booster pumps will be running. The de-energization of the 12A Bus will result in a loss of Condensate Booster Pump 1A which will disrupt the secondary system requiring the crew to do a rapid load reduction.

A, B, and D. Incorrect. Wrong because the loss of either Bus 11A or B would result in a reactor trip due to loss of RCS flow requiring the crew to enter E-0. The loss of Bus 12B has no significant impact on plant operations. These choices are plausible because the applicant must

understand what loads are on which bus and how a loss of these buses would impact plant operations in this situation.

Technical References:	Big Notes 4160V-01 AP-FW.1, ABNORMAL MFW PUMP FLOW OR NPSH AP-TURB.5, RAPID LOAD REDUCTION
Proposed References to be provided:	None
Learning Objective:	R0601C 1.03 R0701C 1.06
Question Source:	New
Question History:	Last NRC Exam N/A
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	063 K2.01	
	Importance	2.9	

K/A Statement: DC Electrical Distribution – Knowledge of bus power supplies to the following: Major DC loads

Question # 49

The plant was at 100% power with normal system alignments when a loss of all AC power occurred.

What is the basis for degassing the main generator in ECA-0.0, Loss of All AC Power?

A. To allow reducing load on the TSC Battery

B. To allow reducing load on 125V Vital Battery 1B

C. To minimize the likelihood of a main turbine lube oil fire caused by loss of cooling

D. To minimize the hydrogen seal leakage that begins as soon as all AC power is lost

Answer: A

Explanation/Justification:

A. Correct. Hydrogen is vented so the air side seal oil pump can be secured. The TSC Vital Battery is the power supply for the pump. The pump is secured to minimize load on the battery.

B. Incorrect. Wrong because in normal system alignment, Batteries 1A or B would not be powering the air side seal oil pump. Plausible because the applicant may think that these could be the power supply for the pump.

C. Incorrect. Wrong because this is not a reason stated in the background document. Plausible because the applicant may think in terms of fire protection.

D. Incorrect. Hydrogen seal leakage will not be caused by a loss of all AC because the DC powered air side seal oil pump will maintain hydrogen sealed in the main generator. The generator is degassed so that the DC seal oil pump can be turned off without resulting in hydrogen leakage out of the hydrogen seals.

Technical References: Big Notes Instrument Buses D/C-01
ECA-0.0, Loss of All AC Power, step 11
ECA-0.0 Background Document, Step 17 and Note
03202-0102, 125 VDC Power Distribution System

Proposed References to be provided: None

Learning Objective: REC00C 2.01

Question Source: New

Question History: Last NRC Exam N/A

Question Cognitive Level: Fundamental

10 CFR Part 55 Content: 55.41 (b) 7

Comments

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	063 A2.01	
	Importance	2.5	

K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the DC electrical systems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Grounds

Question # 50

The plant is operating at 100% power. All systems are in a normal configuration

The following indications are received in the Control Room:

- Annunciator J-23, BATTERY BANK GROUND, has actuated
- Battery 'A' Voltage indicates 109 volts and stable
- EO reports the in-service 'A' Battery Charger Ground Detection Circuit indications as follows:
  - Positive to ground voltage 95 volts and rising slowly
  - Negative to ground voltage 15 volts and lowering slowly
- Electricians are working to identify the location of the ground on Vital DC Bus 'A'

Which of the following describes the actions required for these conditions per Annunciator Response AR-J-23?

A. Trip the Reactor and carry out the Immediate Actions of E-0, Reactor Trip or Safety Injection, then direct EO to locally open the Generator Exciter Field Breaker.

B. Refer to ER-ELEC.2, Recovery from Loss of A or B DC Train, and transfer DC Train 'A' to the TSC Battery.

C. Trip the Reactor and carry out the Immediate Actions of E-0, Reactor Trip or Safety Injection, then direct EO to isolate DC Bus 'A' from Battery 'A'.

D. Refer to ER-ELEC.2, Recovery from Loss of A or B DC Train, and do **NOT** start any loads on DC Train 'A'.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because per ER-ELEC.2, a complete loss of DC Train ‘A’ will result in failure of automatic reactor trip. The procedure directs taking manual actions as necessary to trip the reactor and turbine and to take the exciter field breaker to TRIP.

B. The AR does provide guidance to refer to ER-ELEC.2. However the guidance to transfer DC Train ‘A’ to the TSC battery is contingent upon the failure either being a degraded battery or determined to not be a problem affecting the bus. The stem of this Q provides information indicating the problem IS affecting the bus. It would not be appropriate to transfer this bus problem over to the TSC battery.

C. Incorrect. Plausible to trip the reactor for reasons explained for Distractor Choice A above. If the loss of a DC bus is due to a fault on the bus, then ER-ELEC.2 directs isolation of the DC bus from its battery.

D. Correct. A Caution and Step 4.4 of AR-J-23 both emphasize not changing the equipment loading configuration on the affected DC bus by stating “*NO loads should be started OR restored n respective DC train with an active ground …*” It is important an operator know that changing equipment lineup on an ungrounded DC system that is experiencing a ground could result in equipment damage and/or a plant transient.

Technical References:	ER-ELEC.2, Rev 01502 AR-J-23, Rev 01101
Proposed References to be provided:	None
Learning Objective:	R0901C 1.11
Question Source:	Bank (Minor modification) Question ID: 1705165
Question History:	Last NRC Exam N/A
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 5
Comments	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	064 A2.02	
	Importance	2.7	

K/A Statement: Emergency Diesel Generator – Ability to (a) predict the impacts of the following malfunctions or operations on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Load, VARS, pressure on air compressor, speed droop, frequency, voltage, fuel oil level, temperatures

Question # 51

Given the following plant conditions:

- A loss of offsite power occurred 20 minutes ago.
- Load is 395 KW and steady on 'A' Emergency Diesel Generator (EDG).
- Offsite power will NOT be restored for two to three days.

WHICH ONE of the choices below correctly describes the appropriate diesel loading action for 'A' EDG per precautions and limitations of T-27.4, Diesel Generation Operation?

A. Raise load greater than 488 KW to ensure exhaust stack discharge is clear.

B. Raise load greater than 975 KW for 1 hour every 10 hours to minimize possibility of erratic output frequency.

C. Raise load greater than 488 KW for 1 hour every 10 hours to ensure exhaust stack discharge is clear.

D. Raise load greater than 975 KW to minimize possibility of erratic output frequency.

Answer: A

Explanation/Justification:

A. Correct. Precautions 4.3 and 4.7 provide guidance raise/maintain load greater than 25%/488KW. The question and the precautions of this procedure were based upon lessons learned from INPO IER L2-11-46 (OE-2011-002780) “Extended Emergency Power Operations Following a Loss of Off-Site Power” INPO Recommendation #7 Response (Guidance for Light Load Operation). Maintaining EDG load greater than 25% will ensure the exhaust temperature remains high enough to prevent “souping” of lube oil in the exhaust system, as evidenced by heavy black and gray smoke (not clear), thereby minimizing the chance for a fire.

B. Incorrect. Raising load above 50%/975KW 1 hr in every 10 is a listed method, but not for the reason given in the distractor choice.

C. Incorrect. This action is similar to a listed method but the power level is wrong. Plausible because the applicants may forget whether loading is to be above 25% or 50% for 1 hr every 10 hrs.

D. Incorrect. Wrong because the precautions specify maintaining load above 25%, not 50%, to prevent a fire hazard. Plausible because the applicants may confuse the warning about being greater than or less than 25% load. Also, frequency fluctuations at low EDG loads were addressed in INPO IER L2-11-46.

Technical References:	T-27.4, Rev 04203, Section 4: Precautions Lesson R0801C Slides 17-21, and 191-192	
Proposed References to be provided:	None	
Learning Objective:	R0801C 1.09	
Question Source:	New	
Question History:	Last NRC Exam	N/A
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 5 55.43 (a) 5 55.45 (a) 3 & 13	

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	073 G2.1.20	
	Importance	4.6	

K/A Statement: Process Radiation Monitoring - Ability to interpret and execute procedure steps

Question # 52

The plant is at 100% power steady state operations when the following conditions are observed:

- Annunciator A-5, CCW SURGE TANK HI LEVEL 58.8% is lit
- CCW Radiation Monitor, R-17, is in alarm
- VCT level is lowering
- Pressurizer level is on program
- RCP seal leak off temperatures are 140°F
- Seal leak off flows are 3.4 and 3.6 gpm
- RCP “A” and “B” labyrinth seal d/p’s are approximately 35”
- Letdown flow is 35 gpm
- Letdown pressure is approximately 250 PSIG
- Letdown pressure control valve, PCV-135, demand is approximately 25% open
- Nuclear Sample Room Heat Exchanger CCW Return Flow is 82 gpm
- Nuclear Sample Room Heat Exchanger CCW Return Temperature is 94°F

WHICH ONE of the following actions is directed by the appropriate procedure for the event in progress?

A. Isolate Normal letdown

B. Isolate Sample Room Heat Exchanger(s)

C. Close RCP Seal Return Isolation Valve MOV-313

D. Close RCP Thermal Barrier CCW Return Valve AOV-754A(B)

Answer: A

Explanation/Justification:

A. Correct. Correct because the plant conditions indicate a leak in the letdown system. A lower than normal letdown flow (flow transmitter is located downstream of the NRHX) and the closing of the PCV-135 to maintain pressure are indicative of a leak in the non-regenerative heat exchanger. The applicant must be able to distinguish between normal and off-normal conditions to diagnose the event to take the correct actions per AP-CCW.1, Leakage into the Component Cooling Loop.

B. Incorrect. Wrong because these actions are at the end of the procedure. The applicants would have to misdiagnose the leak in the letdown system to get to this point in the procedure. Plausible because these are actions contained within the procedure.

C. Incorrect. Wrong because these actions would be taken if there was a seal return heat exchanger leak. Plausible because the applicants have to properly diagnose the event and this action would isolate seal return if the applicants thought that seal return pressure was higher than CCW pressure.

D. Incorrect. Wrong because these actions would be taken if there was a thermal barrier leak. Plausible because the applicants have to properly diagnose the event and these actions are in the procedure to address a thermal barrier leak.

Technical References: AP-CCW.1, Leakage into the Component Cooling Loop.
EOP Figure 4, RCP Seal Leakoff
Reactor Coolant Pump Big Notes
O-6.1, Equipment Operator Rounds and Log Sheets, Attachment 6

Proposed References to be provided: None

Learning Objective: R2801C 1.10 &1.11

Question Source: New

Question History: Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CFR Part 55 Content: 55.41 (b) 10
55.43 (a) 5
55.45 (a) 12

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	076 K1.19	
	Importance	3.6	

K/A Statement: Service Water - Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: SWS emergency heat loads.

Question # 53

A break occurs in the piping just downstream of Service Water A/B Loop Crosstie Valve to Spool Piece (IB), V-4623 (33013-1250, Sheet 1, B-8).

An EO has split the A & B SW Headers per ATT-2.5 Split SW Headers

WHICH of the following heat loads downstream will still be affected by the break?

Note: Reference(s) attached.

A. Containment Recirc Fan Coolers 'A' & 'B' and the Turbine Driven Auxiliary Feedwater Pump SW Suction

B. Containment Recirc Fan Coolers 'C' & 'D' and the Motor Driven Auxiliary Feedwater Pumps SW Suction

C. Safety Injection Pumps and Charging Pump Room Coolers

D. Battery Room A/C Unit and Instrument Air Compressor Coolers

Answer: A

Explanation/Justification:

A. Correct. According to the Service Water Big Notes Drawing, Containment Coolers A & B and the Turbine Driven Auxiliary Feedwater Pump are downstream of the valve. The question requires applicants to know the layout of the SW system and how a break will affect downstream heat loads.

B, C, Incorrect. Wrong because although some of these heat loads are downstream of 4623 and would initially be affected by the leak, after isolating 4625, 4756 and 4739 they would no longer be affected by the break in the SW system. Plausible because the question requires the applicants to possess an understanding of the layout of the SW system and therefore they could confuse which loads are located on which part of the system.

D. Incorrect. The battery room and air compressor coolers are not downstream of 4623.

Technical References:	Service Water Big Notes Drawing
Proposed References to be provided:	Print 33013-1250, Sheets 1, 2 and 3 Print 33013-1251, Sheets 1 and 2
Learning Objective:	R5101C 106 & 108
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 2 - 9 55.45 (a) 7 - 8

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	078 K3.02	
	Importance	3.4	

K/A Statement: Instrument Air - Knowledge of the effect that a loss or malfunction of the IAS will have on the following: Systems having pneumatic valves and controls

Question # 54

The plant is at 49% power and increasing.
All systems are in automatic.

Assuming **no operator action**, and considering each separately, if Instrument Air was isolated to the following valves, WHICH would lead to a reactor trip?

A. Heater Drain Pump Recirculation Valve AOV-3365

B. Letdown AOV-427

C. Charging Line Valve HCV-142

D. Letdown Valve AOV-371

Answer: D

Explanation/Justification:

A. Incorrect. Wrong because AOV-3365 fails open on a loss of IA. The HDTPs will trip after one minute with the recirc valve failed open. However, below 50% with two condensate pumps running, there would be no significant impact to feedwater flow or S/G levels. Plausible because if power were above 50%, the crew would have to do a rapid load reduction is stabilize the secondary side and prevent a trip.

B. Incorrect. Wrong because AOV-427 fails open on a loss of IA and has no effect on letdown flow or inventory as it is located upstream of the orifice valves. Plausible because the

applicants make wrongly think that letdown valves would isolate on a loss of IA to conserve RCS inventory. This valve is an exception to that.

C. Incorrect. Wrong because HCV-142 fails open on a loss of IA. With HCV-142 full open, the only effect would be a loss of seal injection. RCP operation can continue with thermal barrier cooling in operation. Net flow into the RCS would be the essentially the same because of the PDPs. Any loss of inventory would be made up by the makeup system. Plausible because the applicants may wrongly think that with the valve full open, that PZR level would increase to the trip set point.

D. Correct. AOV-371 fails closed on a loss of IA. Without letdown, the PZR level would increase, due to charging and seal injection, to the High PZR Level trip set point.

Technical References: EOP Attachment 11.0, IA Concerns
Big Notes CVCS
AP-FW.1, Abnormal MFW Pump Flow or NPSH

Proposed References to be provided: None

Learning Objectives: R1601C, CVCS, 1.06, 1.10
4701C 1.04

Question Source: New

Question History: Last NRC Exam N/A

Question Cognitive Level: Comprehension

10 CFR Part 55 Content: 55.41 (b) 7
55.45 (a) 6

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	1	
	K/A #	103 K1.08	
	Importance	3.6	

K/A Statement: Containment – Knowledge of the physical connections and/or cause-effect relationships between the containment system and the following systems: SIS, including action of safety injection reset

Question # 55

Given the following plant conditions:

- A reactor trip has occurred.
- Safety Injection (SI) and Containment Isolation (CI) have actuated.
- Containment pressure is 10 psig.
- The US has directed the Shift Chemistry Tech to sample S/Gs for activity.

Which ONE of the following completes the statement relating to minimum actions necessary to enable operation of S/G Blowdown Sample Isolation Valves, AOV-5735 and AOV-5736?

The **MINIMUM** actions that are necessary to enable operation of the valves are the reset of ____(1)____ **AND** then the reset of ____(2)____ train(s) of X-Y Relays.
.

	(1) Isolation Signal Reset	(2) X-Y Relay Reset
A.	SI **AND** CI	**ONLY ONE**
B.	CI **ONLY**	**ONLY ONE**
C.	SI **AND** CI	**BOTH**
D.	CI **ONLY**	**BOTH**

Answer: C

Explanation/Justification:

A. Incorrect. Part 1 is correct. Part 2 is plausible since the applicant may think that resetting just one train the X-Y Relays may be sufficient to allow operation of the valves.

B. Incorrect. Part 1 is plausible since the applicant may believe that only resetting the CI signal will allow resetting of the X-Y Relays. Incorrect since the CI signal can NOT be reset without resetting the SI signal. Part 2 is plausible since the applicant may think that resetting just one train the X-Y Relays may be sufficient to allow operation of the valves.

C. Correct. In accordance with 10905-0737/0738, AOV-5735/5736 cannot be reset and opened until the Containment Isolation signal is cleared/reset. According to 33013-1353, Sheet 7, the Containment Isolation signal CANNOT be reset until the Safety Injection signal is reset. Part 2. Either train of X-Y relays will keep the valves closed. Both trains of relays must be reset in order to open the valves. Tthe SI signal and the CI signal must BOTH be reset before resetting of the X-Y Relays is possible.

D. Incorrect. Part 1 is plausible since the applicant may believe that only resetting the CI signal will allow resetting of the X-Y Relays. Part 2 is correct.

Technical References:	10905-0737 10905-0738 33013-1353, Sheet 7 R2101C (Slides 48 and 49)
Proposed References to be provided:	None
Learning Objective:	2101C 1.04
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 9
Comments:	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	001 K3.02	
	Importance	3.4	

K/A Statement: Control Rod Drive – Knowledge of the effect that a loss or malfunction of the CRDS will have on the following: RCS

Question # 56

Given the following plant conditions:

- The plant is at 90% power steady state conditions.
- Control Bank D is at 200 steps.
- All systems are in automatic except Volume Control Tank (VCT) make up is disarmed.
- A dropped rod event occurs.
- The plant stabilizes several minutes later with no operator action.

Which of the choices below correctly completes the statement describing the effect of the rod drop on pressurizer level and VCT level as compared to their respective pre-transient values?

Pressurizer level will be ______ and VCT level will be ________ . (Assume no RCS leakage)

A. lower, higher

B. the same, lower

C. lower, the same

D. the same, the same

Answer: C

Explanation/Justification:

A. Incorrect. A dropped rod will cause Tavg to lower. When Tavg drops, the PZR level will lower due to lower density of the water and the pressurizer program level setpoint will also lower with Tavg. Therefore there is no need for makeup to the pressurizer and VCT level will remain constant.

B. Incorrect. See justification for correct answer. Plausible because the applicant may the level control system will maintain pressurizer level at original level setpoint following the dropped rod.

C. Correct. A dropped rod will cause Tavg to lower. When Tavg drops, the PZR level will lower due to lower density of the water and the pressurizer program level setpoint will also lower with Tavg. Therefore there is no need for makeup to the pressurizer and VCT level will remain constant. Per design, the pressurizer level will change in proportion to the RCS temperature change and the program level setpoint is varied with Tavg accordingly, thereby minimizing generation of waste water. Rod Control in automatic would normally restore Tavg to match Tref within a band, which would cause the pressurizer level control system to restore pressurizer level to near the pre-transient level. However, Ginna does not have automatic rod withdrawal.

D. Incorrect. See justification correct answer. Plausible because the applicant may think that Rod Control in automatic will restore Tavg to Tref, which would cause the pressurizer level control system to restore pressurizer level to the pre-transient level. However, Ginna does not have automatic rod withdrawal.

Technical References:	Big Notes, Rod Control AP-RCC.2, RCC/RPI MALFUNCTION AP-Turb.2, TURBINE LOAD REJECTION
'Proposed References to be provided:	None
Learning Objective:	RAP29C 2.01
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7 55.45 (a) 6

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	015 G2.2.42	
	Importance	3.9	

K/A Statement: Nuclear Instrumentation – Ability to recognize system parameters that are entry-level conditions for Technical Specifications

Question # 57

During a Reactor Startup, the following conditions exist:

- Permissive P-6 has just energized.
- Source Range Channel N31 indicates 4 x 10^3 cps.
- Source Range Channel N32 indicates 5 x 10^3 cps.
- Intermediate Range Channel N35 indicates 2 x 10^{-11} amps.
- Intermediate Range Channel N36 indicates 5 x 10^{-10} amps.

WHICH ONE of the following statements is correct?

A. Channel N35 is undercompensated. The startup can continue to MODE 1.

B. Channel N36 is undercompensated. The startup can **NOT** continue to MODE 1.

C. Channel N35 is overcompensated. The startup can continue to MODE 1.

D. Channel N36 is overcompensated. The startup can **NOT** continue to MODE 1.

Answer: B

Explanation/Justification:

B. Correct. IR N36 is undercompensated therefore it is inoperable and thus the startup cannot continue per TS 3.3.1 Function 3 and TS 3.0.4. Recognizing that a mode change cannot occur is testing the applicants' knowledge to recognize TS entry conditions.

A. Incorrect. Wrong because IR N35 is reading properly but Mode change is prohibited by TS because IR N36 is inoperable. Plausible because the applicant may misdiagnose the failure and believe the startup can continue because only one of the two IRs greater than P-6 will allow the manual blocking of the SR trip.

C. Incorrect. Wrong because IR N35 is reading properly but Mode change is prohibited by TS because IR N36 is inoperable. Plausible because the applicant may misdiagnose the failure and believe the startup can continue because only one of the two IR's greater than P-6 will allow the manual blocking of the SR trip.

D. Incorrect. Wrong because IR N36 is undercompensated not overcompensated. Plausible because one IR is inoperable and a Mode change is prohibited by TS.

Technical References:	Big Notes, NIS TS 3.3.1 and 3.0.4 P-1, Reactor Control and Protection System
Proposed References to be provided:	None
Learning Objective:	R3301C 1.12
Question Source:	Modified (from ID# 1703839)
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7 & 10 55.43 (a) 2 & 3 55.45 (a) 3

Comments

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	2	
	Group #	2	
	K/A #	016 K1.06	
	Importance	3.6	

K/A Statement: Nonnuclear Instrumentation – Knowledge of the physical connections and/or cause-effect relationships between the NNIS and the following systems: AFW system

Question # 58

WHICH ONE of the following choices contains a list of conditions, each of which would result in the given auxiliary feedwater pump(s) running?

A. Motor Driven Pumps: Safety Injection Signal
1 of 2 MFW pump breakers open
EITHER Steam Generator 2/3 levels < 17%

B. Motor Driven Pumps: AMSAC Actuation
Safety Injection Signal
BOTH Steam Generators 2/3 level < 17%

C. Turbine Driven Pump: AMSAC Actuation
Loss of Voltage on EITHER 11A or 11B Bus
EITHER Steam Generator 2/3 level < 17%

D. Turbine Driven Pump: Safety Injection Signal
Loss of Voltage on BOTH 11A and 11B Buses
BOTH Steam Generators 2/3 level < 17%

Answer: B

Explanation/Justification:

B. Correct. Correct because all of the conditions listed would result in the MDAFW pumps running. Either S/G < 17% will provide a start signal for both pumps.

A. Incorrect. Wrong because both MFW pump breakers must be open to generate a start signal for the MDAFW pumps.

C. Incorrect. Wrong because the TDAFW pump does not start on an SI signal and both S/G levels must be at or below the set point. Plausible because the applicants could confuse the start signals between the MDAFW pumps and the TDAFW pump.

D. Incorrect. Wrong because both busses must be de-energized. Plausible because the applicants could confuse the start signals or the logic inputs between the MDAFW pumps and the TDAFW pump.

Technical References:	Lesson 4201C, Aux Feedwater, slides 62 and 86 Big Notes Aux Feed
Proposed References to be provided:	None
Learning Objective:	4201C, Aux Feedwater 1.07
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 2 - 9 55.43 (a) 7 - 8

Comments: The question attempts to meet the KA by having the applicants understand the cause-effect relationship between S/G level (NNIS) and the AFW system actuation signals.

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	028 G2.1.28	
	Importance	4.1	

K/A Statement: Hydrogen Recombiner and Purge Control - Knowledge of the purpose and function of major system components and controls

Question # 59

Three days after a large break LOCA with containment H_2 concentration at 3.5%, the crew implements S-21.1, Hydrogen Recombiner A Purging and Operation.

After achieving the desired normal combustor temperature, the following occurs:

- SOV-10208S, H2 Main Fuel Line Solenoid Operated Isol Vlv to Recombiner A, fails closed.

Assuming no further operator action, what is the effect of this failure on combustor outlet temperature?

Combustor outlet temperature will drop and stabilize...

A. above 1270 °F.

B. at 600 °F.

C. at 450 °F.

D. below 160 °F.

Answer: D

Explanation/Justification:

D. Correct. The closure of the main fuel block valve will cause the combustion temperature to lower from 1400 °F. At 1275 °F the block and isolation valves for the pilot line will close and all

combustion will stop. Temperature will eventually equalize with ambient conditions at combustor outlet. Ambient containment temperature must be **at or below** the prerequisite ambient containment temperature of 155°F, stated in S-21.1 for operation of the recombiner. This operational limitation is based on vendor documentation of a maximum inlet temperature for the recombiner blower motor of 155°F. Key answer is that combustor outlet temperature will be below 160°F to encompass all possible allowable temperatures for recombiner operation while balancing with format of its mirror-style distractor choice.

A. Incorrect. Wrong because the loss of the main fuel line will starve the combustor of fuel and temperature will lower to ambient condition. Plausible because the applicants may remember a parallel pilot fuel path to the combustor and wrongly assume that it was for redundancy. The main and pilot hydrogen shut off if temperature drops <1275 °F. The distractor value of "above 1270°F" is intended to encompass the 1275°F interlock value and balance with the key answer format.

B. Incorrect. Wrong because temperature will continue to lower below 600 °F due to the lack of fuel. Plausible because the applicants may forget that all fuel is isolated to the combustor when temperature reaches 1275 °F. 600 °F is the temperature achieved by the combustor when it is fed by the pilot line.

C. Incorrect. Wrong because temperature will continue to lower below 450 °F due to the lack of fuel. Plausible because the applicants may be confused by the interlock that shuts off pilot line hydrogen on startup if temperature remains <450 °F at 60 seconds after start.

Technical References:	S-21.1, Hydrogen Recombiner A Purging and Operation. R6501C, H2 Recombiners, Slides 67, 72, 84, 89, 96, 114	
Proposed References to be provided:	None	
Learning Objective:	R6501C 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 5 55.43 (a) 5 55.45 (a) 3 & 13	

Comments: There is no plant data book for using a power setting for Ginna's recombiners. Combustion rate is based upon a targeted temperature. The temperature is controlled by fuel supplied to the combustor. A failure of the fuel line was intended to the test the applicants'

knowledge on the effect of system temperature and hence the ability to predict system response.

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	034 A3.02	
	Importance	2.5	

K/A Statement: Ability to monitor automatic operation of the Fuel Handling System, including: Load limits

Question # 60

Which ONE of the following correctly completes the statements below?

Given the following choices, the required Manipulator Crane overload setpoints will be higher when:

(1) withdrawing an assembly from ____(1)____ core position;
AND
(2) withdrawing the Dummy Assembly from the Upender with the Refueling Cavity ___(2)___ .

Note: Reference(s) attached.

A. (1) a peripheral
(2) drained

B. (1) a peripheral
(2) flooded

C. (1) the center
(2) drained

D. (1) the center
(2) flooded

Answer: C

Explanation/Justification:

A. Incorrect. Part 1 is plausible if the applicant thinks a peripheral rod requires more lifting force and therefore a higher Manipulator Crane overload setpoint. Part 2 is correct..

B. Incorrect. Part 1 is plausible if the applicant thinks a peripheral rod requires more lifting force and therefore a higher Manipulator Crane overload setpoint. Part 2 is plausible since the applicant may not recognize that the flooded Refueling Cavity will provide a "buoyancy effect" for the fuel assembly which results in a lower Overload Limit required.

C. Correct. Part 1: In accordance with RF-302, Fuel Handling Tool Checkout and Operation in Containment, Attachment 13, a fuel assembly containing a RCCA has a higher weight and requires a higher Overload Limit to be set for the Manipulator Crane. The center assembly contains a RCCA. None of the peripheral assemblies contain RCCAs. Part 2: A Dry assembly requires a higher Overload Limit setting than a Wet assembly since there is no "buoyancy effect".

D. Incorrect. Part 1 is correct and Part 2 is wrong. Part 2 is plausible since the applicant may not recognize that the flooded Refueling Cavity will provide a "buoyancy effect" for the fuel assembly which results in a lower Overload Limit required.

Technical References:	RF-302, Attachment 13	
Proposed References to be provided:	RF-302, page 114	
Learning Objective:	R3701C 1.07	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 7	

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	041 K4.11	
	Importance	2.8	

K/A Statement: Knowledge of SDS design feature(s) and/or interlock(s) which provide for the following: T-ave/T-ref program

Question # 61

Turbine load was reduced from full load (600 MW) during night shift to 545 MW in preparation for main turbine stop valve testing, which is planned for later in the day.

Then, with control rods in MANUAL, turbine load suddenly experiences a step drop of 98 megawatts. Current load is 447 megawatts.

Which of the following statements below correctly describes operation of the condenser steam dump valves two seconds after this step load reduction?

A. The steam dump valves will be responding to an open modulation signal.

B. ALL steam dump valve groups will be responding to a snap open signal.

C. The steam dump valves have NOT yet met all plant conditions needed to open valves.

D. ONLY two steam dump valve groups will be responding to a snap open signal.

Answer: A

Explanation/Justification:

A. Correct
Steam dumps will modulate open due to loss of load P4 being energized, due to > 10% turbine load step decrease. The magnitude of the load decrease will immediately result in a Tavg – Tref error of 4.4 °F, exceeding the dead band on the controller. The fractional turbine load change, 98/600 equals a 16.3% load change. Tavg ramps from 547°F at no load to 574 °F at

full load, a change of 27 °F. The temperature error will initially be 16.3% of 27°F, or 4.4 °F, greater than the nominal controller deadband of 4.0 °F.

B. Incorrect.
Plausible because if temperature error increases above 11°F all 4 group of steam dumps will go full open, however current plant conditions indicate a temperature error less than 11°F. Groups A and B receive snap open signal at delta T of 7.5°F, where Groups C and D receive snap open signal at delta T of 11.0°F

C. Incorrect.
Steam dump will modulate open due to loss of load P4 being energized. Plausible if applicant does not identify that conditions have been met to energize P4.

D. Incorrect.
Plausible because if temperature error increases above 7.5°F the Group A and B steam dumps will get snap open signal, however current plant conditions indicate a temperature error less than 7.5°F.

Technical References:	R4501C Steam Dump System - RG (Slide 32)	
Proposed References to be provided:	None	
Learning Objective:	R4501C 107	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8	

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	071 A1.06	
	Importance	2.5	

K/A Statement: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Waste Gas Disposal System operating the controls including: Ventilation system

Question # 62

Given the following plant conditions:

- The plant is operating at 100% power.
- Gas Decay Tank release is in progress.
- The following alarm is received:
    - R14, PLANT VENT NOBLE GAS

Select the choice that indicates ALL of the following component responses that are expected for the given plant conditions.

1. RCV-014, GDT Release AOV closes.
2. Aux Building Ventilation Isolation occurs.
3. Waste Gas Compressors trip if running.

A. 1 ONLY

B. 1 AND 2 ONLY

C. 2 ONLY

D. 1, 2 AND 3

Answer: B

Explanation/Justification:

A. Incorrect. RCV-014 does close, but whether in Filter-In or Filter-Out, the Aux Building fans will also trip

B. Correct.

C. Incorrect. If the R-14 alarm is received, RCV-14 will also close due to high radiation

D. Incorrect. Plausible because the first 2 actuations do occur. Applicant may consider WG Compressor operation as a contributor towards the alarm. WG compressor trips typically on low pressure, not hi rad.

Technical References:	R3801C P-9, Radiation Monitor System
Proposed References to be provided:	None
Learning Objective:	R3801C 1.05
Question Source:	Bank
Question History:	(2011 SRO Retake)
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	072 K3.02	
	Importance	3.1	

K/A Statement: Knowledge of the effect that a loss or malfunction of the ARM system will have on the following: Fuel handling operations

Question # 63

Given the following plant conditions:

- A refueling outage has started
- Core off-load is in progress
- Annunciator E-24, RMS AREA MONITOR HIGH ACTIVITY has actuated
- Operators have determined that the FAIL ALARM has actuated on Radiation Monitor R-2, Containment Area Monitor
- Parts to repair R-2 are estimated to arrive on site in approximately 3 days

With R-2 failed, core off-load ...

A. must be stopped, may resume ONLY if R-2 is restored to OPERABILITY.

B. must be stopped, may resume when a local monitor is installed on the manipulator bridge.

C. may continue if R-7, In-Core Detectors Area Monitor, is OPERABLE.

D. may continue if EITHER R-29 OR R-30, Containment High Range Monitor, is OPERABLE.

Answer: B

Explanation/Justification:

A. Incorrect: Plausible because it is partially correct. However, the procedure allows a local monitor on the manipulator bridge to be substituted.

B. Correct. O-15.1 specifies either R-2 or a local monitor on the manipulator bridge.

C. Incorrect: Plausible because a substitute monitor is permitted. R-7 is a monitor inside Containment but is NOT the designated substitute.

D. Incorrect: Plausible because a substitute monitor is permitted. R-29 and R-30 are monitors inside Containment but are NOT the designated substitute.

Technical References:	O-15.1, page 21
Proposed References to be provided:	None
Learning Objective:	R3701C 1.09
Question Source:	Bank
Question History:	2010 Ginna NRC Q35
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	075 K2.03	
	Importance	2.6	

K/A Statement: Knowledge of bus power supplies to the following: Emergency/essential SWS pumps

Question # 64

Given the following plant conditions:

- The unit is at 100% power.
- "B" and "C" Service Water pumps are running.
- "A" and "D" Service Water pumps are selected.
- The normal supply breaker to Bus 17 trips open.

How will the Service Water System (SWS) pumps respond? (**Assume no operator action**)

A. "D" Service Water pump will start 40 seconds after the EDG breaker closes.

B. "D" Service Water pump will start 17 seconds after the EDG breaker closes.

C. "A" Service Water pump will start 40 seconds after the EDG breaker closes.

D. "A" Service Water pump will start 17 seconds after the EDG breaker closes.

Answer: A

Explanation/Justification:

A. Correct. On an undervoltage the running SW pump will trip and only the selected SW pump will start for that train 40 seconds after "B" D/G breaker closes.

B. Incorrect. 17 seconds is if there was a SI signal concurrent with an undervoltage condition.

C. Incorrect. Plausible if the applicant does not understand the power supply of the SW pumps, On an undervoltage the running SW pump will trip and only the selected SW pump will start for that train 40 seconds after EDG breaker closes.

D. Incorrect. Plausible if the applicant does not understand the power supply of the SW pumps and determines that SI signal was concurrent with undervoltage.

Technical References:	LP R5101C, Service Water System	
Proposed References to be provided:	None	
Learning Objective:	R5101C 1.05, 1.07	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehensive	
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8	

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	086 A4.06	
	Importance	3.2	

K/A Statement: Ability to manually operate and/or monitor in the control room: Halon system

Question # 65

The following alarms were received simultaneously on the Fire Control Panel in the Control Room:

- Z18 - Control Bldg. 271-0 Main Relay Room
- First Alarm S08 - Control Bldg. 271-0 Rly Rm Computer Rm Auto Halon

What is the condition of the Halon system for the Relay Room and the Computer Room one minute after receiving these alarms?

	Relay Room Halon status	**Computer Room Halon status**
A.	NOT actuated	NOT actuated
B.	Actuated	Actuated
C.	Actuated	NOT actuated
D.	NOT actuated	Actuated

Answer: A

Explanation/Justification:

A. Correct. If the system had actuated, would have the following alarms: First Alarm, Second Alarm and a Flow Alarm. The systems were originally installed as separate protection zones with separate sensors, logic, piping, alarms, and dump system. However, the door between the two areas has been removed. And the logic has been changes such that any 2 of the sensors 4 sensors in the computer room or the 10 sensors in the relay room will cause actuation and open separate dump valves to the two different area's nozzles. The sensors

are now a 2 out of 14 logic.. The areas still have separate halon dump systems so it makes sense to talk about a particular room's system being actuated. This question tests the applicant's understanding that the logic is common for both areas and that it can be actuated by a fire sensor in one room concurrent with a separate second fire sensor in the other room, as well as actuating off 2 sensors in the same room.

B. Incorrect. With only the first alarm in the Halon system will not actuate

C. Incorrect. With only the first alarm in the Halon system will not actuate

D. Incorrect. With only the first alarm in the Halon system will not actuate

Technical References:	Fire Panel (FCP); SC-3.2.7 Immediate Action	
Proposed References to be provided:	None	
Learning Objective:	R5901C 1.02	
Question Source:	Bank	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8	

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.1.21	
	Importance	3.5	

K/A Statement: Ability to verify the controlled procedure copy.

Question # 66

Given the following:

- Shift management determined that an evolution covered by Section 6.3 of a Non-Safety Related, Continuous Use Procedure must be performed.
- The Equipment Operator assigned to perform the evolution reviewed the current Revision 9 of the procedure online and noted the change summary for Revision 9 was "*steps have been added in Section 6.7*".
- Prior to printing the procedure, the computer network stopped working.
- Computer network repairs are expected to take 8 hours.
- There is a copy of Revision 8 of the procedure available.

In accordance with HU-AA-104-101, Procedure Use and Adherence, the Equipment Operator...?

A. can use Section 6.3 of Revision 8 to perform the evolution without further actions.

B. can NOT proceed with the evolution until a copy of Revision 9 is obtained.

C. can use Revision 8 to perform the evolution ONLY after the US evaluates it for any fatal flaws.

D. can use Section 6.3 of Revision 8 without further action to perform the evolution, PROVIDED that Revision 9 actions are verified complete and documented when a copy can be obtained.

Answer: C

Explanation/Justification:

A. Incorrect. Plausible since the revision summary indicates the change likely doesn't impact the Section to be performed. However, the action is incorrect since superseded procedures can NOT be used without additional specified actions.

B. Incorrect. Plausible since the Equipment Operator MAY wait until the current procedure revision prints, but this is not a required by HU-AA-104-101.

C. Correct. In accordance with HU-AA-104-101, Procedure Use and Adherence, Section 3.1.3, "*Superseded revisions may still be used for applicable work tasks provided a Supervisory evaluation is done to ensure no fatal flaw exists and it will be removed from further use upon task completion.*"

D. Incorrect. Plausible since the previous revision is not likely to cause problems and reasonable that one would double check with the correct procedure as soon as possible afterward. Incorrect since HU-AA-104-101 does not allow use of a superseded revision unless a supervisory review is performed.

Technical References:	HU-AA-104-101	
Proposed References to be provided:	None	
Learning Objective:	RAD07C 1.02	
Question Source:	Modified Bank	
Question History:	Last NRC Exam	2014 Byron
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	

Comments:

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.1.30	
	Importance	4.4	

K/A Statement: Ability to locate and operate components, including local controls.

Question # 67

Which one of the following procedure types **DOES NOT** provide specific component location information utilized to operate <u>Safety Related</u> equipment in the plant?

A. Alarm Response

B. Ops Administrative

C. Emergency Plan

D. Abnormal Operating

Answer: C

Explanation/Justification:

A. Incorrect: This answer is incorrect due to Alarm Response Procedures providing specific component location information. This choice is plausible since Alarm Response Procedures not being normally utilized to locate components in the plant. The applicant that does not recall this type of procedure providing location information would select this answer choice.

B. Incorrect: This answer is incorrect due to Operations Administrative Procedures providing specific component location information. This choice is plausible since Operations Administrative Procedures not being normally utilized to locate components in the plant. The applicant that does not recall this type of procedure providing location information would select this answer choice.

C. Correct. The primary source of component location information are the System Operating Procedures (S). Of the procedure choices provided, ONLY Emergency Plan Procedures do not provide specific component location information utilized to operate equipment in the plant. The following types of procedures were evaluated for inclusion in this question which

required the NOT statement in the stem (not enough procedure types that do NOT provide component location to make a positive stem question):
1) System Operating Procedures (S) – do
2) Emergency Plan (EP) – do NOT
3) Abnormal Operating (AP) – do
4) General Operating (O) – do
5) Administrative (various) – do
6) Alarm Response (AR) – do
7) Equipment Restoration (ER) – do
8) Functional Restoration (FR) – do
9) Emergency Operating (EOP) – do

D. Incorrect: This answer is incorrect due to Abnormal Operating Procedures providing specific component location information. This choice is plausible since Alarm Response Procedures not being normally utilized to locate components in the plant. The applicant that does not recall this type of procedure providing location information would select this answer choice.

Technical References:	AR-B-31, Revision 9 AP-CVCS.3 (Step 8a RNO), Revision 015 A-3.3, Revision 028	
Proposed References to be provided:	None	
Learning Objective:	None	
Question Source:	Bank	
Question History:	Last NRC Exam	2015 Cooper (Q #67)
Question Cognitive Level:	Fundamental	
10 CRF Part 55 Content:	55.41 (b) 7	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.2.13	
	Importance	4.1	3

K/A Statement: Knowledge of tagging and clearance procedures.

Question # 68

Which ONE of the following parameters and associated values would REQUIRE a TAGOUT, based on the definition of a "Hazardous Energy" in accordance with OP-CE-109-101, Clearance and Tagging? (Assume NO instrument calibrations will be performed.)

Work on a(n) ...

A. electrical system with a maximum voltage of 50 volts AC.

B. electrical system with a maximum voltage of 40 volts DC.

C. hydraulic system with a maximum pressure of 50 psig.

D. hydraulic system with a maximum temperature of 110 °F.

Answer: A

Explanation/Justification:

A. Correct. Per procedure a tagout is required for equal to or greater than 50 volts (AC OR DC).

B. Incorrect. Per procedure a tagout is required for equal to or greater than 50 volts (AC OR DC).

C. Incorrect. Per procedure a tagout is required for equal to or greater than 60 psig hydraulic pressure and/or greater than 120°F temperature.

D. Incorrect. Per procedure a tagout is required for equal to or greater than 60 psig hydraulic pressure and/or greater than 120°F temperature.

Technical References:	OP-CE-109-101, Rev 3	
Proposed References to be provided:	None	
Learning Objective:	N-CE-SA-CT-CIN 1.5	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8	

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	<u>RO</u>	<u>SRO</u>
	Tier #	3	
	Group #		
	K/A #	G2.2.43	
	Importance	3.0	

K/A Statement: Knowledge of the process used to track inoperable alarms.

Question # 69

A Control Room Annunciator window has a Black Dot sticker placed on it.

Which ONE of the following could be the reason for the Black Dot, in accordance with OPG-ANNUNCIATOR-FLAGGING?

A. The annunciator is part of a tagout.

B. The annunciator is a nuisance alarm.

C. The annunciator is removed from service.

D. An input to a multiple input annunciator is out of service.

Answer: B

Explanation/Justification:

A. Incorrect. Per procedure a Red dot would be placed on the window to indicate that it is part of a tag.

B. Correct. Per procedure a Black dot would be placed on the window 1) for maintenance activity that causes a repeating alarm, 2) to identify a locked-in alarm caused by current station configuration, or 3) to identify nuisance alarms with the approval of the US.

C. Incorrect. Per procedure a Blue dot would be placed on the window to indicate it has been taken out of service.

D. Incorrect. Per procedure a Yellow dot would be placed on the window to indicate that one or more inputs to a multiple input annunciator are out of service.

Technical References:	OPG-ANNUNCIATOR-FLAGGING, Rev 2	
Proposed References to be provided:	None	
Learning Objective:	I2LP-ILO-EOPFRC 1	
Question Source:	Modified	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8	

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.3.4	
	Importance	3.2	

K/A Statement: Knowledge of radiation exposure limits under normal or emergency conditions.

Question # 70

The following plant conditions exist:

- A LOCA outside Containment occurred 15 minutes ago
- The Shift Manager declared a SITE AREA EMERGENCY
- The faulted line was isolated locally, however the EO performing the task was injured and CANNOT leave the area on his own
- Dose estimates for the area are 75 R/hr, primarily due to gamma radiation

If the voluntary EPA guideline (Emergency) limits are NOT exceeded, which of the following choices is the maximum allowed time frame for the team to rescue the EO in the noted area? (Assume the entire rescue team enters the area at the same time.)

This clarification statement was added to Question # 70 during exam administration.

A. 4 minutes

B. 8 minutes

C. 20 minutes

D. 40 minutes

Answer: C

Explanation/Justification:

A. Incorrect
Plausible because per EP-CE-113 TEDE Limit of 5 Rem is controlled activity during the emergency limit.

B. Incorrect.
Plausible because per EP-CE-113 TEDE Limit of 10 Rem is to protect valuable property.

C. Correct.
Per EP-CE-113 TEDE Limit of 25 Rem is for Lifesaving or protection of large populations.

D. Incorrect.
Plausible if applicant thinks voluntary limit is 10 times the annual dose limit.

Technical References:	EP-CE-113, Personnel Protective Actions, Rev 0
Proposed References to be provided:	None
Learning Objective:	RSC02C17.00
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehensive
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.3.12	
	Importance	3.2	

K/A Statement: Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.

Question # 71

Given the following plant conditions:

- The Reactor is critical and at 2% power.
- A containment entry is underway looking for a leak identified during the startup, with a team consisting of a Mechanic and an RP tech.
- They request permission to enter the reactor cavity area and "A" sump to determine the leak location.
- Both team members are wearing all the required dosimetry
- The RP tech has a portable radiation monitoring device that will cover the expected dose rates.

What is the correct personnel action in accordance with A-3, Containment Vessel Access Requirements?

A. They may not enter either of the areas at this time.

B. They may enter the "A" sump, but not the reactor cavity area.

C. If reactor power is lowered to 0.5% to 1%, they may enter both areas.

D. As long as the RP tech stays with the mechanic, they can enter both areas.

Answer: A

Explanation/Justification:

A. Correct: Per A-3, Containment Vessel Access Requirements precaution 3.5: When the reactor is critical, personnel SHALL NOT enter the reactor cavity or A Sump.

B. Incorrect: Entering sump might be possible with RP support, however procedurally not allowed.

C. Incorrect: Plausible but not procedurally allowed.

D. Incorrect: With RP coverage, lends validity to the possibility of entering either area, however procedurally not allowed.

Technical References: A-3, Containment Vessel Access Requirements

Proposed References to be provided:	None
Learning Objective:	RAD02C 1.02
Question Source:	Bank
Question History:	Last NRC Exam Ginna 2008 Q72
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 12

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.2.35	
	Importance	3.6	

K/A Statement: Ability to determine Technical Specification Mode of Operation.

Question # 72

Given the following plant conditions:

- The plant is shutdown, preparing for refueling
- Maintenance is preparing to de-tension reactor vessel head closure bolts
- All systems are normally aligned for the current plant conditions
- At 0600, the following conditions are noted:
  - Cold Leg temperatures: 85°F and stable
  - RCS is depressurized, not vented

Subsequently, at 0602, RHR is lost and ALL Cold Leg temperatures begin rising at 2.2°F/minute.

Based on the given indications and assuming the above conditions and trends continue, which ONE of the following correctly identifies the Tech Spec Mode of Operation at 0600 and at 0700?

	MODE at 0600	**MODE at 0700**
A.	5	3
B.	6	4
C.	5	4
D.	6	5

Answer: C

Explanation/Justification:

A. Incorrect. At 0600, plant is initially in MODE 5 (RCS temp < or equal to 200°F, Keff <0.99). At 0700, RCS temperature will be 212.6°F ([2.2°F/min x 58 min] + 85°F), which is MODE 4 (RCS temp < 350°F). Plausible because the applicant may either calculate incorrectly or confuse MODEs.

B. Incorrect: Plant is in MODE 5 initially. Plant would be in MODE 6 initially if one or more reactor vessel head bolts was less than fully tensioned and will enter MODE 4 at 0613 if current trends continue.

C. Correct: Plant is in MODE 5 initially. Plant is in MODE 4 above 200°F.

D. Incorrect: Plant is in MODE 5 initially. Plant would be in MODE 6 initially if one or more reactor vessel head bolts was less than fully tensioned.

Technical References:	Tech Spec table of definitions
Proposed References to be provided:	None
Learning Objective	RTS00C 1.01
Question Source:	Bank (slightly modified)
Question History:	Last NRC Exam Ginna 2010 Q69
Question Cognitive Level:	Comprehension
10 CRF Part 55 Content:	55.41 (b) 10
Comments:	

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.4.29	
	Importance	3.1	

K/A Statement: Knowledge of the Emergency Plan

Question # 73

Which ONE of the following identifies ...

(1) the Emergency Response Organization Facility responsible for dispatching Emergency Response Teams in the plant during a plant emergency

AND

(2) the lowest Emergency Action Level at which this Emergency Response Facility is required to be staffed?

	(1)	(2)
A.	Operations Support Center	ALERT
B.	Operations Support Center	UNUSUAL EVENT
C.	Technical Support Center	ALERT
D.	Technical Support Center	UNUSUAL EVENT

Answer: A

Explanation/Justification:

A. Correct. The OSC is the organization responsible for dispatching emergency response teams during an emergency and Alert is correct for the lowest level emergency that requires staffing of the OSC.

B. Incorrect. Plausible because the OSC is the organization responsible for dispatching emergency response teams during an emergency and a NOUE is the lowest emergency classification level. The TSC is partially staffed during a NOUE. The OSC is NOT.

C. Incorrect. Plausible because the TSC perfomrs many of the actions normally performed by Main Control Room staff during emergency operations and that an Alert is correct for the lowest level emergency that requires full staffing of the Technical Support Center.

D. Incorrect. Plausible because the TSC performs many of the actions normally performed by Main Control Room staff during emergency operations and that a NOUE is the lowest emergency classification level. The TSC is only partially staffed during a NOUE.

Technical References: EP-AA-1012, Exelon Nuclear Radiological Emergency Plan Annex for Ginna Station

Proposed References to be provided: None

Learning Objective: RSC01C 3.01

Question Source: Bank (slightly modified)

Question History: Last NRC Exam Watts Bar 2013

Question Cognitive Level: Fundamental

10 CFR Part 55 Content: 55.41 (b) 10

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.4.25	
	Importance	3.3	

K/A Statement: Knowledge of fire protection procedures.

Question # 74

Given the following plant conditions:

- A fire has been reported in the Auxiliary Building Basement.
- The crew is responding per ER-FIRE.3, Alternate Shutdown for Aux Building Basement/Mezzanine Fire.
- ER-FIRE.3 directs closing MOV-856, RHR Pump Suction From RWST, on the west side of the RWST.

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

A. To prevent RWST from potentially draining to Containment Sump B due to spurious operation of RHR Pump suction valves MOV-850A or 850B.

B. To prevent inadvertent RCS boration due to spurious operation of RWST to Charging Pump Suction valves LCV-112B and 112C.

C. To ensure RWST suction to RHR Pumps is maintained in case of spurious operation of RHR system valves due to a hot short in the control circuitry.

D. To align a boration flowpath to the suction of the Charging Pumps in case Emergency Boration Valve MOV-350 failure to operate due to a hot short in the control circuitry.

Answer: A

Explanation/Justification:

A. Correct. ER-FIRE.3 Contains actions to locally close MOV 856 to prevent backflow to the sump in the event that the 850 valve were to inadvertently open due to a fire in this location.

B. Incorrect. MOV 856 isolates RHR, not LCV-112 valves, but plausible because spurious operation is a concern and the VCT makeup valves are part of the concern.

C. Incorrect. MOV-856 is used for isolation purposes, not maintaining operational flowpaths. Plausible because control room evacuation procedure does require manipulation of components to maintain conditions rather than to prevent conditions.

D Incorrect. MOV-856 is used for isolation purposes, not maintaining operational flowpaths. Plausible because control room evacuation procedure does require manipulation of components to maintain conditions rather than to prevent conditions.

Technical References:	ER-FIRE.3
Proposed References to be provided:	None
Learning Objective:	RER22C 10.00
Question Source:	Bank
Question History:	Last NRC Exam Ginna 2011 Retake (Q#65)
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 10
Comments:	

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #	3	
	Group #		
	K/A #	G2.4.31	
	Importance	4.2	

K/A Statement: Knowledge of annunciator alarms, indications, or response procedures.

Question # 75

Given the following plant conditions:

- Plant is operating at 100% power.
- A Surveillance Test briefed during your shift turnover is in progress.
- ALL expected alarms were identified during the brief.
- Alarm Response procedures for the expected alarms to be received during the Surveillance Test have NOT been reviewed.

An annunciator then alarms (first annunciation of this alarm for the shift) due to the Surveillance Test, at the appropriate time.

What is/are the minimum alarm response action(s) required of the HCO/CO in accordance with OP-AA-103-102, Watch-Standing Practices?

A. Acknowledge and report the annunciator **AND** reference the Alarm Response procedure.

B. Acknowledge and reference the Alarm Response procedure, **ONLY**.

C. Acknowledge and report “Expected Alarm”, **ONLY**.

D. Acknowledge the annunciator, **ONLY**.

Answer: A

Explanation/Justification:

A. Correct. In accordance with OP-AA-103-102, Section 4.5.5, "**If** an alarm is directly related to a planned activity but all expected alarm requirements were **not** met, **then** the standard for unexpected alarms shall be followed."

B. Incorrect. Plausible as this would be the required actions had the expected alarm been flagged and discussed with the US, but the associated Alarm Response procedure had not been reviewed prior to receipt.

C. Incorrect. Plausible as this would be the required actions had the expected alarm's Alarm Response procedure been reviewed prior to receipt of the alarm.

D. Incorrect. Plausible as this would be the required actions had the requirements for an expected alarm been completed.

Technical References:	OP-AA-103-102	
Proposed References to be provided:	None	
Learning Objective:	RAD74C 1.01	
Question Source:	Bank (slightly modified)	
Question History:	Last NRC Exam	Cooper 2015 Q#74
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.41 (b) 10	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	APE 8 AA2.18	
	Importance		3.0

K/A Statement: Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Computer indications for RCS temperature and pressure.

Question # 76

Given the following plant conditions:

- The plant is operating at 100% power with plant parameters as indicated on the **attached** CET display printout.
- The crew notes Pressurizer pressure and level dropping rapidly.
- The reactor is manually tripped and Safety Injection is actuated.
- RCPs are running.
- After the crew transitions from E-0 to E-1, the STA observes:
  - CETs: 100°F above the values on the attached display
  - RCS pressure: 1200 psig and slowly rising
  - CNMT pressure: 5.5 psig and stable
  - PRZR level: 100%
  - RVLIS fluid fraction: 55% and stable
  - SI flow: 0 gpm

Which of the following is required?

Note: Reference(s) attached.

A. Implement E-1 to monitor plant equipment for optimal mode of operation.

B. Immediately transition to FR-C.1, Response to Inadequate Core Cooling.

C. Implement foldout page RCP trip criteria to trip all reactor coolant pumps.

D. Immediately transition to FR-C.2, Response to Degraded Core Cooling.

Answer: D

Explanation/Justification:

A. Incorrect. Orange path FR-C.2 met.

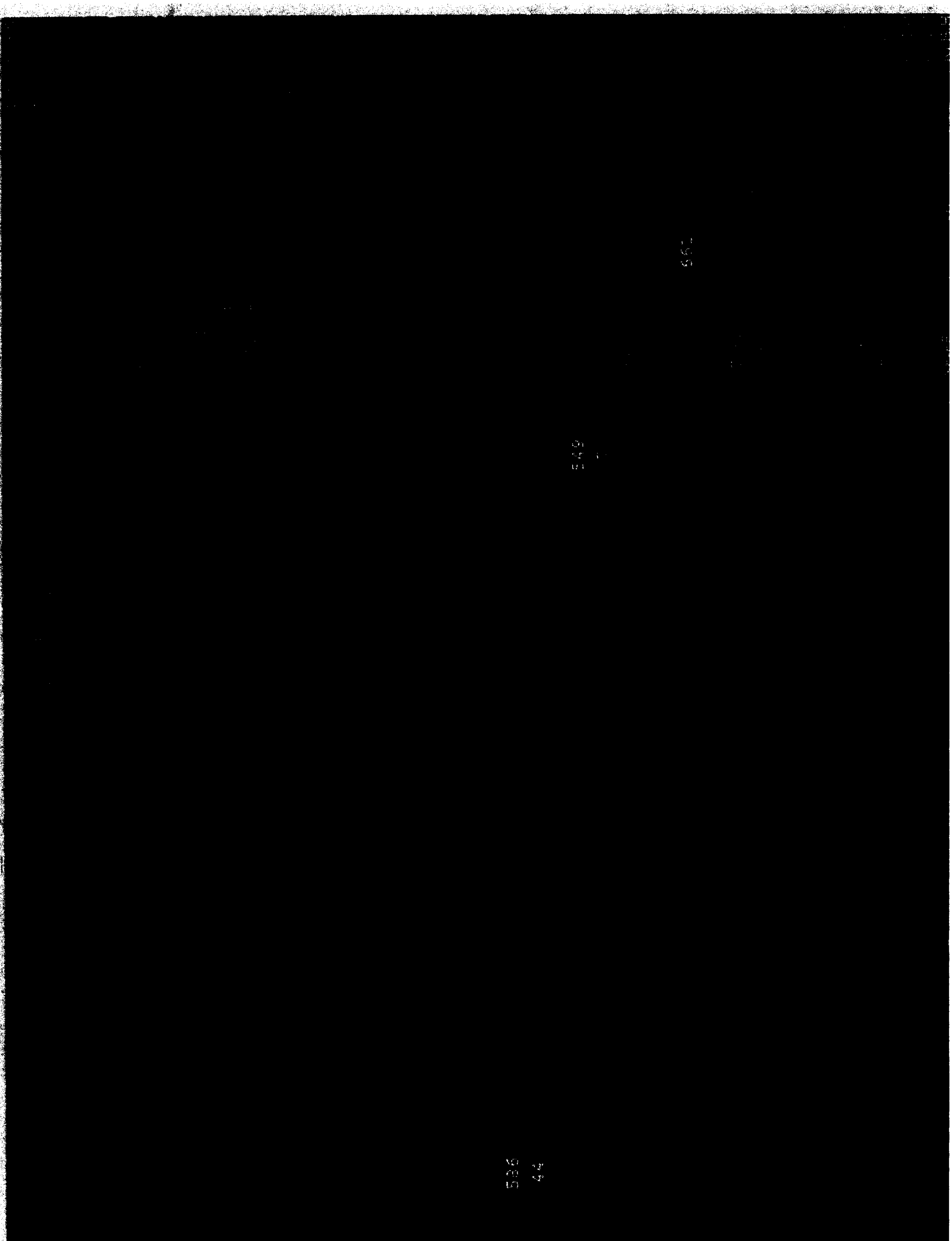
B. Incorrect. Requires 1200 °F

C. Incorrect. Red or orange path FR is priority. Per BG document, running RCPs should not be stopped.

D. Correct. Orange path FR at < 66% RVLIS Fluid Fraction.

Technical References:	F-0.2 CSFST FR-C.2 FR-C.2 BG
Proposed References to be provided:	CET display of 100% power conditions FIG-1.0, Figure Min Subcooling
Learning Objective:	RFRC2C, 1.02
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8

Comments:



EXAMINATION

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	EPE 011 EA2.11	
	Importance		4.3

K/A Statement: Ability to determine or interpret the following as they apply to a Large Break LOCA: Conditions for throttling or stopping HPI.

Question # 77

A LOCA is in progress. The crew has just transitioned from E-1, Loss of Reactor or Secondary Coolant to ES-1.1, SI Termination.

Which of the following is a criterion for transition from E-1 to ES-1.1 that does **NOT** require a return to E-1 if the condition degrades after the transition?

A. RCS subcooling > 0 °F

B. Pressurizer level > 10% [30%]

C. SG NR level > 7% [25%] or feed flow > 200 gpm

D. CETs stable or lowering

Answer: C

Explanation/Justification:

A. Incorrect. ES-1.1 foldout criteria

B. Incorrect. ES-1.1 foldout criteria

C. Correct. Required to leave E-1, not a return from ES-1.1

D. Incorrect. Not a transition criterion

Technical References: E-1, ES-1.1

Proposed References to be provided:	None
Learning Objective:	RES11C 2.01 REP01C 2.01
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.43 (b) 5
Comments:	

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	APE 22 AA2.04	
	Importance		3.8

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

Question # 78

Given the following plant conditions:

- The plant is operating at 100% with all parameters at programmed or design values.
- A loss of all Charging occurs.
- The operator isolates letdown.
- Total combined RCP Seal Leakoff is 6 gpm.

All plant parameters are initially at programmed or design values.

(1) Assuming no operator actions are taken, approximately how many hours will elapse before the AOP directed reactor trip setpoint will be reached,

AND

(2) If AP-CVCS.3, "Loss of All Charging" is performed and charging is **NOT** restored, will an EAL declaration be required? (Disregard any EAL based solely on the 'judgment' category, stated in the EAL tables as "*other conditions exist which in the judgment of the Emergency Director ... which indicate a potential degradation of plant safety*")

Note: Steam tables are provided.

A. 5 hours; YES

B. 5 hours; NO

C. 7 hours; YES

D. 7 hours: NO

Answer: B

Explanation/Justification:

100% Program Level: 56%
Trip required at 5% PZR level by AP-CVCS.3
58.82 gals/% (3600 gal/61.2% from PPT Slide 35)
6 gpm RCP seal leakoff (cold) = 10 gpm (hot) out of PZR
58.82 gals/% / 10 gals/min = 5.882 min/% level decrease
51% total level decrease * 5.882 min/% level decrease = 300 minutes to reach 5%

A. Incorrect. Part 1 is correct. Part 2 is incorrect. EAL declaration is not required.

B. Correct. Part 1 is correct. See calculation above. 5 hours to lower level from 56% to 5% due to seal leakoff inventory loss. Requires knowledge of the normal level, the procedurally directed trip setpoint, and ability to perform pressurizer level/volume/rate calculation. Part 2 is correct. No EAL declaration threshold is or will be met. This question tests at the SRO-only knowledge level because it tests an SRO-only job function, that of determining EAL declarations, and relates to assessment of plant conditions (normal, abnormal, or emergency) and then selection of a procedure or section of a procedure to mitigate or recover, or with which to proceed.

C. Incorrect. Part 1 is incorrect. If applicant does not correct for temp, and thinks trip at 20%, low end of control band (36% * 9.8 min/% = 352.8 min, ~6 hours). Part 2 is incorrect. Notification is not required for the pre-planned sequence of operations in AP-CVCS.3.

D. Incorrect. Part 1 is incorrect. If applicant does not correct for temp, calc based on 6 gpm = 9.8 min/% to 5% (51% *9.8 min/% = 499.8 min, ~8.25 hours).). Part 2 is correct. 10CFR50.72 notification is not required.

Technical References:	AP-CVCS.3, Rev 14 R1401C, PZR & PRT PPT, Rev 25
Proposed References to be provided:	Steam Tables
Learning Objective:	R1401C 1.09 RAP31C 2.01
Question Source:	New
Question History:	Last NRC Exam NA

Question Cognitive Level: Comprehension

10 CFR Part 55 Content: 55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	EPE 029 G2.1.28	
	Importance		4.1

K/A Statement: Knowledge of the purpose and function of major system components and controls.

Question # 79

The following plant conditions exist:

- A small break LOCA has occurred
- The reactor failed to trip
- Reactor Power is 10% trending down
- RCS pressure is 1200 psig trending down
- S/G pressures are 1000 psig stable
- S/G WR levels are 290 inches trending down
- SI has actuated properly
- AFW failed to start manually or automatically

What action is required regarding the RCPs, and why?

NOTE: E-0, Reactor Trip or Safety Injection
FR-H.1, Response to Loss of Secondary Heat Sink
FR-S.1, Response to Reactor Restart/ATWS

A. Trip RCPs because FR-H.1 entry criteria is met.

B. Trip RCPs because of E-0 foldout page RCP trip criteria.

C. Leave RCPs in service - for core cooling due to FR-S.1 entry.

D. Leave RCPs in service – for heat removal due to bleed and feed criteria not met.

Answer: C

Explanation/Justification:

A. Incorrect. Loss of AFW leads to FR-H.1, however FR-S.1 guidance takes priority over FR-H.1.

B. Incorrect. E-0 contains a note before Step 5 that states "*FOLDOUT page should be open and monitored periodically,* The E-0 background document explains "*It is not appropriate to delay performance of Immediate Actions while reading this note, nor is it appropriate to perform actions on the Foldout Page before Immediate Actions are complete. Specifically, tripping the RCPs before ensuring the reactor is tripped is an undesired action. Therefore, this note is moved to step 5.*" The transition to FR-S.1 is at E-0 Step 1 RNO.

C. Correct. A caution in FR-S.1 states the RCP's should not be tripped with reactor power greater than 5%. For the given conditions, the crew should have or will transition to and implement FR-S.1, as the highest priority.

D. Incorrect. RCPs are left running because of FR-S.1 entry, not for FR-H.1. Also, loss of heat sink bleed and feed criteria not yet met.

Technical References:	FR-S.1 and Background doc	
Proposed References to be provided:	None	
Learning Objective:	RFRS1C 1.03, 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.43 (b) 5	
Comments:		

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	W E12 G2.4.47	
	Importance		3.8

K/A Statement: Excessive Heat Transfer - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Question # 80

The plant was in MODE 2 following a refueling outage when indications were received of a high energy line break in the Turbine Building.

The crew has transitioned to ECA-2.1, Uncontrolled Depressurization of Both Steam Generators. Operators stopped SI Pumps and shortly thereafter observe the following plant conditions:

• RCS pressure	1685 psig and steady
• Pressurizer level	36% and slowly rising
• 'A' S/G pressure	17 psig and steady
• 'A' S/G wide range level	160 inches and steady
• 'B' S/G pressure	35 psig and slowly rising
• 'B' S/G wide range level	200 inches and slowly rising
• Subcooled margin	172°F and rising
• RHR Pumps	running
• SI Pumps	stopped

Which of the following is the **NEXT** required crew action?

A. Transition to E-2, Faulted Steam Generator Isolation.

B. Transition to E-3, Steam Generator Tube Rupture.

C. Stop both RHR Pumps.

D. Start both SI Pumps.

Answer: C

Explanation/Justification:

A. Incorrect. E-2 foldout page transition criteria is specified as any S/G pressure rising, except while performing SI Termination Steps 17 and 18. Indications show SI termination actions of Step 17 in progress. Plausible because the transition out of ECA-2.1 would be to E-2 following S/G isolation if not performing SI termination steps.

B. Incorrect. E-3 transition criteria given as uncontrolled S/G level rise or abnormal radiation levels. Given conditions are consistent with successful secondary isolation of the 'B' SG. A tube rupture small enough to allow RCS pressure to continue to rise would not result in repressurization of a faulted SG. Plausible choice because WR level is rising.

C. Correct. Stopping both RHR pumps is the next directed action in ECA-2.1 Step 17.

D. Incorrect. SI pumps would only be restarted to address loss of primary inventory indications of lowering pressurizer level or subcooled margin. Plausible because Step 18 monitors for need to reinitiate and applicant may incorrectly a SGTR.

Technical References:	ECA-2.1, Rev 03601	
Proposed References to be provided:	None	
Learning Objective:	REC21C 1.04, 2.01	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.43 (b) 5	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		1
	K/A #	APE 057 G2.2.42	
	Importance		4.6

K/A Statement: Loss of Vital AC Instrument Bus - Ability to recognize system parameters that are entry-level conditions for TS

Question # 81

The plant is in MODE 3 with a cooldown in progress per O-2.2, Plant Shutdown from Hot Shutdown to Cold Conditions, when the supply breaker to AC Instrument Bus 'C' trips due to a sustained fault on the Instrument Bus.

Which of the following TS LCO Condition(s) **MUST** be entered, in accordance with Section 3.0, Limiting Condition For Operation (LCO) Applicability.

1. LCO 3.3.3 Condition A
2. LCO 3.8.7 Condition A
3. LCO 3.8.9 Condition B

Note: Reference(s) attached.

A. 3 ONLY

B. 2 AND 3 ONLY

C. 1 AND 3 ONLY

D. 1 AND 2 AND 3

Answer: B

Explanation/Justification:

A. Incorrect. TS 3.8.7 and 3.8.9 conditions must be entered. TS 3.3.3 condition is not required to be entered.

B. Correct. TS 3.8.7 and 3.8.9 conditions must be entered. TS 3.3.3 condition is not required to be entered.

Regarding TS 3.8.9 Condition B, per the given conditions Instrument Bus C is de-energized due to a sustained fault. Condition B is entered in MODES 1 thru 4 if "one AC instrument bus is inoperable. Per the TS Bases Table B 3.8.9-1, AC Instrument Bus C is a Train B Instrument Bus covered by this TS. Therefore the crew must enter TS 3.8.9 Condition B.

Regarding TS 3.8.7 Condition A, although Inverter 1B, which normally feeds Instrument Bus C is not damaged, it must be considered INOPERABLE. Per the basis for TS 3.8.7, "*For an inverter to be OPERABLE, the associated instrument bus must be powered by the inverter with output voltage within tolerances with power input to the inverter from a 125 VDC power source.*" The Inverter is INOPERABLE since it is not supplying its instrument bus. Therefore the crew must enter TS 3.8.7 Condition A.

Regarding TS 3.3.3 Condition A, TS 3.0.6 states that "*When a supported system LCO is not met solely due to a support system LCO not being met, the Conditions and Required Actions associated with this supported system are not required to be entered. Only the support system LCO ACTIONS are required to be entered.*" Therefore, in accordance with TS 3.0.6, TS 3.3.3 Condition A **is not required** to be entered on the loss of power to Containment Area Radiation (High Range) Channel R-30 (a Function 10 instrument under the PAM instrumentation TS).

C. Incorrect. TS 3.8.7 and 3.8.9 conditions must be entered. TS 3.3.3 condition is not required to be entered.

D. Incorrect. TS 3.8.7 and 3.8.9 conditions must be entered. TS 3.3.3 condition is not required to be entered.

Technical References:	TS 3.0.6, TS 3.3.3, TS 3.8.7, TS 3.8.9 TS Figure B 3.8.4-1
Proposed References to be provided:	TS 3.3.3 (pages 3.3.3-1, thru 3.3.3-4) TS 3.8.7 (page 3.8.7-1) TS 3.8.9 (page 3.8.9-1) ER-INST.3 Attachment 5 (page 18 of 18)
Learning Objective:	R0901C 1.13
Question Source:	New

Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension]	
10 CFR Part 55 Content:	55.43 (b) 2	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	APE 028 G2.1.28	
	Importance		4.1

K/A Statement: Pressurizer Level Control Malfunction: Knowledge of the purpose and function of major system components and controls

Question # 82

The plant is operating at 100% power.
The controlling pressurizer level channel fails high.

What is the long term effect on the plant with **no operator action**?
What is a Technical Specification referenced by ER-INST-1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure, for this malfunction?

A. Reactor trip on High Pressurizer Level
TS 3.4.9, Pressurizer.

B. Reactor trip on High Pressurizer Level
TS 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.

C. Reactor trip on Low RCS Pressure
TS 3.4.9, Pressurizer.

D. Reactor trip on Low RCS Pressure
TS 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.

Answer: A

Explanation/Justification:

Transient response: The controlling Pressurizer level channel fails high. Charging flow lowers in response. Pressurizer level drops until letdown isolates and heaters cut off, then level rises to the high level reactor trip setpoint, resulting in reactor trip.

A. Correct. Letdown isolates, PZR fills to trip. There are no applicable action requirements under the immediate conditions for either listed TS LCO. However, when the heaters cutoff on low level, TS 3.4.9 would be entered. ER-INST.1 does not specifically direct referencing TS 3.4.9 because it would apply if the instrument failed low. Detailed knowledge of which TS's are listed in ER-INST.1 is SRO knowledge.

B. Incorrect. No ESF on low level; applicant may think letdown isolation is ESF.

C. Incorrect. Applicant may think low level heater trip results in low press trip.

D. Incorrect. No ESF TS referenced.

Technical References:	ER-INST.1; Inst Failure PPT slide 53	
Proposed References to be provided:	None	
Learning Objective:	RIC03C 1.12	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.43 (b) 2,5	

Comments:

EXAMINATION

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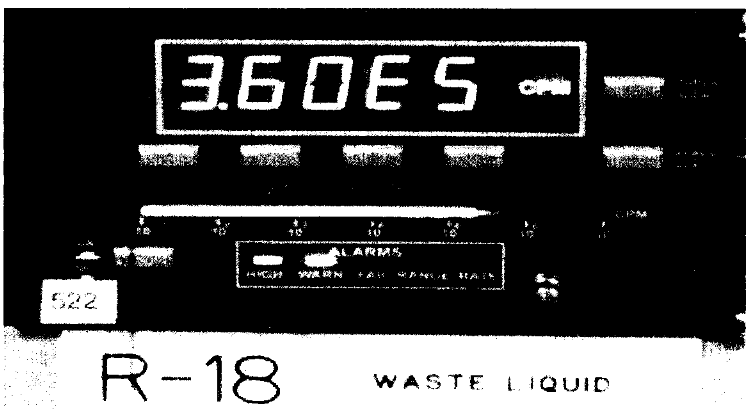
Exam Outline Cross Reference:	Level:	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	APE 059 AA2.05	
	Importance:	3.9	

K/A Statement: Ability to determine and interpret the following as they apply to the Accidental Liquid Radwaste Release: The occurrence of automatic safety actions as a result of a high PRM system signal.

Question: # 83

The plant is operating at 100% power. The 'B' Monitor Tank is being released to the Discharge Canal per S-3.4K, Releasing Monitor Tank A or B to Discharge Canal.



1) What action is required, **AND**
2) assuming R-18 is determined INOPERABLE, what compensatory action is required by the ODCM regarding monitoring the radioactivity of the release to allow the liquid release to resume?

A. 1) Verify RCV-18 automatically closes.
   2) Per the ODCM, at least two independent samples taken at least 1 hour apart must be analyzed and determined to agree within a specified percentage of total activity in the tank.

B. 1) Verify RCV-18 automatically closes.
   2) Per the ODCM, a grab sample must be analyzed once every 24 hours and

determined to agree within a specified percentage of total activity in the tank.

C. 1) Manually close RCV-18.
2) Per the ODCM, at least two independent samples taken at least 1 hour apart must be analyzed and determined to agree within a specified percentage of total activity in the tank.

D. 1) Manually close RCV-18.
2) Per the ODCM, a grab sample must be analyzed once every 24 hours and determined to agree within a specified percentage of total activity in the tank.

Answer: A

Explanation / Justification

A. Correct. Per ODCM 6.1.4, Action 2 for less than minimum channels operable requires two independent samples. RCV-18 is designed to close automatically on a R-18 high alarm. The high alarm is set at 72,000 cpm (7.2E4 cpm). The value given in the stem is 5 times higher than the alarm setpoint.

B. Incorrect. Action listed is not correct for R-18 monitor. Plausible because the action contains elements of the correct answer and an action specified for clean system rad monitors

C. Incorrect. Auto isolation should occur above alarm setpoint.

D. Incorrect. Action listed is not correct for R-18.

Technical References:	ODCM AR-RMS-18, R-18 Liquid Waste P-9, Radiation Monitoring System, Rev 10000 S-3.4K
Proposed References to be provided:	None
Learning Objective:	R3901C 1.06, 1.11
Question Source:	New
Question Cognitive Level:	Comprehension

10CFR Part 55 Content: 55.43 (b)4

Comments:

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	APE 061 AA2.06	
	Importance		4.1

K/A Statement: Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: Required actions if alarm channel is out of service.

Question # 84

Given the plant has been operating at 100% power.

Consider the timeline below related to instruments, all of which are required by TS 3.3.3, Post Accident Monitoring (PAM) Instrumentation.

Timeline

--- Question # 84 deleted from the exam ---

07/01/18:	• CST Level Instrument LT-2022B is declared INOPERABLE
07/02/18:	• Hot Leg Temperature Instrument TE-409A-1 is declared INOPERABLE
07/05/18:	• High Range Containment Area Monitor R-29 is declared INOPERABLE
07/07/18:	• CST Level Instrument LT-2022B is restored to OPERABLE • Hot Leg Temperature Instrument TE-409A-1 is restored to OPERABLE
07/10/18:	• High Range Containment Area Monitor R-30 is declared INOPERABLE
07/12/18:	• High Range Containment Area Monitor R-29 is restored to OPERABLE

Assuming no further changes in conditions, which date starts the clock for the earliest action that will be required by TS 3.3.3?

Note: Reference(s) attached.

A. 07/10/18

B. 07/05/18

C. 07/02/18

D. 07/01/18

Answer: B

Explanation/Justification:

A. Incorrect. The AOT clock begins when R-29 becomes inoperable, not when R-30 becomes inoperable. Plausible because R-29 has been restored. Applicant may incorrectly think the separate condition entry note may allow for separate entry for each of the two containment monitors.

B. Correct. R-29 and R-30 are the two PAM Function10 Containment high range area monitor channels. The AOT clock would begin when R-29 becomes inop and would continue even after R-29 is restored because R-30, another monitor for the same function becomes inop before R-29 becomes operable. If either monitor is not restored to OPERABLE within 30 days then an entry into Condition B would be required, with a required action of initiating a special report immediately.

C. Incorrect. TE-409A-1 is a Function 3 channel. Condition A does not apply to Functions 3 and 4. Condition C would be entered for TE-409A-1 and exited when it was restored to operable status. Plausible because applicant could be confused about application of the TS LCO 3.3.3 Condition D applies. Function 10 has two required channels and they are both INOPERABLE, which requires <u>one</u> of the channels restored to OPERABLE within 7 days. <u>Both</u> channels do not need to be restored within 7 days.

D. Incorrect. Tech Spec 3.3.3 allows separate condition entry for each function. TS LCO 3.3.3 Condition A would be separately entered; once when LT-2022B (a Function 11 channel) became inoperable and a second time when R-29 (a Function 10 channel) became inoperable, tracking separate 30 day completion times. Condition A is exited for the LT-2022B entry when LT-2022B, leaving the AOT for R-29 still counting down based on initial inoperability of R-29, not LT-2022B.

Technical References: TS table 3.3-1 function 10

Proposed References to be provided: TS 3.3.3 (pages 3.3.3-1 thru 3.3.3-4)

Learning Objective:	R3901C 1.13	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 11	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		1
	Group #		2
	K/A #	APE 067 AA2.05	
	Importance		3.6

K/A Statement: Ability to determine and interpret the following as they apply to the Plant Fire on Site: Ventilation alignment necessary to secure affected area

Question # 85

Given the following plant conditions:

- A 21-day Refueling Outage has just been completed
- The plant is at 70% power and continuing with load ascension per O-1.2, Plant Startup from Hot Shutdown to Full Load
- Movement of recently irradiated fuel assemblies is in progress in the Spent Fuel Pool
- A fire alarm is received on Z04, Auxiliary Building 271.0 Bus 14 CCW Area
- The fire has been confirmed and the Fire Brigade has operated ventilation to stop the spread of fire/smoke per the appropriate Fire Response Plan

Select the choice below which correctly completes the following statements.

(1) The Auxiliary Building Ventilation System (ABVS) is ____(1)____.

(2) Movement of irradiated assemblies in the Auxiliary Building ____(2)____ continue.

A. (1) OPERABLE
   (2) CAN

B. (1) OPERABLE
   (2) can NOT

C. (1) INOPERABLE
   (2) CAN

D. (1) INOPERABLE
   (2) can NOT

Answer: D

Explanation/Justification:

A. Incorrect. Plausible if the applicant does not understand the ventilation operations that will be required in accordance with the Fire Response Plan and believes that ABVS is still OPERABLE which would also allow for the continued movement of irradiated fuel assemblies in the Spent Fuel Pool.

B. Incorrect. Part 1 is plausible if the applicant does not understand the ventilation operations that will be required in accordance with the Fire Response Plan and believes that ABVS is still OPERABLE. Part 2 is correct.

C. Incorrect. Part 1 is correct. Part 2 is plausible if the applicant does not recognize that the ABVS is required to be OPERABLE for movement of irradiated fuel assemblies that have decayed < 60 days.

D. Correct. In accordance with Tech Spec LCO 3.7.10, "ABVS shall be OPERABLE and in operation during movement of irradiated fuel assemblies in the Auxiliary Building when one or more fuel assemblies in the Auxiliary Building has decayed < 60 days since being irradiated." According to Tech Spec Bases for LCO 3.7.10, The ABVS is considered OPERABLE when its associated exhaust fans are OPERABLE and in operation. FRP-6.0, Auxiliary Building Operating Floor, has the Fire Brigade secure the Auxiliary Building some of the exhaust fans until the fire is out. The specific fans that are secured are required for ABVS operability and the ABVS is therefore rendered INOPERABLE. Tech Spec LCO 3.7.10, Condition A Required Action is to "Suspend movement of irradiated fuel assemblies in the Auxiliary Building" with a Completion Time of "Immediately"

   This Q is SRO-only because the ventilation system realignment actions that must be performed and not immediate actions and require detailed understanding of specific mitigation action steps in the fire fighting strategies document for the Aux Building Operating Floor. The TS Bases explains which specific ABVS components are required for system operability.

Technical References:	Tech Spec and Tech Spec Bases LCO 3.7.10 FRP-6.0 Rev 010 (page 3)
Proposed References to be provided:	None
Learning Objective:	R2201C 1.12
Question Source:	New

Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.43 (b) 2	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	006 A2.06	
	Importance		3.5

K/A Statement: Emergency Core Cooling - Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: water hammer

Question # 86

The unit is operating at 100% power and the following conditions exist:

- It is 1200 hours on August 1st.
- "A" SI Pump is INOPERABLE due to repairs estimated to take 48 hours.
- An audit of completed surveillance procedures has determined that the check for gas accumulation in the "B" SI Pump line (SR 3.5.2.8) was last performed 90 days ago.

WHICH ONE of the following describes the required action per Technical Specifications?

Note: Reference(s) attached.

A. Declare 'B' SI Pump INOPERABLE at 1200 on August 1st. Enter TS 3.0.3 immediately.

B. Declare 'B' SI Pump INOPERABLE at 1200 on August 1st. Demonstrate 'B' SI Pump OPERABLE no later than 1200 on August 2nd, or enter TS 3.0.3.

C. Maintain 'B' SI Pump in OPERABLE status. Demonstrate 'B' SI Pump OPERABLE no later than 1200 on August 2nd, or enter TS 3.0.3.

D. Maintain 'B' SI Pump in OPERABLE status. Demonstrate 'B' SI Pump OPERABLE no later than 1200 on September 1, or declare 'B' SI pump INOPERABLE.

Answer: D

Explanation/Justification:

A. Incorrect. Wrong because 'B' SI Pump can go up to 31 days before being declared inoperable due to excessive gas accumulation in its line. Plausible because the applicants may wrongly believe the 6 hours completion time in Action B is applicable because the surveillance frequency was missed.

B. Incorrect. Wrong because TS 3.0.3 would be entered immediately if both SI Trains were inoperable. Plausible because the applicants may wrongly believe that “B” SI Pump is inoperable because it has exceeded the surveillance time by approximately 200%.

C. Incorrect. Wrong because “B” SI Pump can go up to 31 days before being declared inoperable due to excessive gas accumulation in it’s the line. Plausible because the applicant may wrongly apply the guidance of SR 3.0.3 and think that they have 24 hours to perform the surveillance.

D. Correct. SR 3.5.2.8 was missed by two months. If it is discovered that a Surveillance was not performed within its specified frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is greater. In this case, 31 days is the applicable limit. This delay period is permitted to allow performance of the Surveillance. Therefore, the “B” SI Pump is not inoperable.

Technical References:	TS 3.5.2, ECCS TS bases for 3.5.2, ECCS TS Section 3.0, LCO and SR applicability Surveillance Frequency Control Program, Rev 7
Proposed References to be provided:	1) TS 3.5.2, ECCS 2) Surveillance Freq Ctrl Program (page SFCP-8, showing only entries associated with TS LCO 3.5.2. Entries for other LCOs redacted.)
Learning Objective:	RTS00C ITS Overview R2701C 1.13
Question Source:	Modified (Bank ID 1703853)
Question History:	Latest NRC Exam N/A
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 5 55.45 (a) 5

Comments: The KA for this question pertained to the subject of water hammer impacting the ECCS. In order to address the KA for an SRO level question, the missed surveillance which is used to check for excessive gas build up in the ECCS line (which is for the prevention of water hammer per the TS bases) was introduced into the question. The rationale was that if this surveillance was missed for several months, then the likelihood of gas accumulation, and thus the occurrence of water hammer, would need to be addressed.

EXAMINATION

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Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	012 A2.03	
	Importance		3.7

K/A Statement: Reactor Protection - Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Incorrect channel bypassing

Question # 87

Given the following plant conditions:

- Plant is operating at 100% power
- Pressurizer pressure channel PT-449 fails low
- The crew has implemented AP-PRZR.1, Abnormal Pressurizer Pressure and has stabilized the plant
- While performing the defeat in accordance with ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure, the CO becomes distracted and inadvertently defeats PT-431

Select the choice that completes the following statement.

The US will transition to ________(1)________ from E-0, Reactor Trip or Safety Injection, **AND** will notify the NRC ________(2)________ from the occurrence of the event per LS-AA-1110 and 10CFR50.72?

A. (1) ES-1.1, Safety Injection Termination
   (2) within a minimum of 4 hours

B. (1) ES-1.1, Safety Injection Termination
   (2) within a minimum of 8 hours

C. (1) ES-0.1, Reactor Trip Response
   (2) within a minimum of 4 hours

D. (1) ES-0.1, Reactor Trip Response
   (2) within a minimum of 8 hours

Answer: C

Explanation/Justification:

A. Incorrect. Part 1 is incorrect but plausible since the failure low of two Pressurizer pressure channels, with the exception of PT-449, would result in an automatic Safety Injection actuation requiring the crew to transition to ES-1.1 from E-0, Step 18. Part 2 is correct.

B. Part 1 is incorrect but plausible since the failure low of two Pressurizer pressure channels, with the exception of PT-449, would result in an automatic Safety Injection actuation requiring the crew to transition to ES-1.1 from E-0, Step 18. Part 2 is plausible since 50.72 addresses 1 hour, 4 hour and 8 hour reports.

C. Correct. In accordance with 33013-1353, Sheet 12, 2 of 4 Pressurizer pressure channels below the Pressurizer Low Pressure trip setpoint (1873 psig) will result in an automatic reactor trip. Since Safety Injection will not have actuated, the crew will transition to ES-0.1 from E-0, Step 4. In accordance with LS-AA-1110, Safety, Reportable Event SAF 1.6 "The licensee shall notify the NRC as soon as practical and in all cases, within four hours of the occurrence of ...any event or condition that results in actuation of the reactor protection system (RPS) when the reactor is critical except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation."

D. Incorrect. Part 1 is correct. plausible since the failure low of two Pressurizer pressure channels, with the exception of PT-449, would result in an automatic Safety Injection actuation requiring the crew to transition to ES-1.1 from E-0, Step 18. Part 2 is plausible since 50.72 addresses 1 hour, 4 hour and 8 hour reports.

Technical References: 33013-1353, Sheet 12
E-0, Reactor Trip or Safety Injection
ES-0.1, Reactor Trip Response
LS-AA-1110, SAF 1.6

Proposed References to be provided: None

Learning Objective: RIC02C 1.06a

Question Source: Bank (modified)

Question History: Last NRC Exam 2013 Callaway

Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 7

Comments: SRO level since it requires knowledge of specific reporting requirements.

EXAMINATION

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	022 A2.04	
	Importance		3.2

K/A Statement: Containment Cooling - Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of service water

Question # 88

Given the following plant conditions:

- The plant is at 100% power steady state.
- Service Water Pumps 'A' and 'C' were initially in service.
- Service Water Pump 'B' is started.
- Service Water Pump 'A' is then secured in preparation for changing the oil.

Shortly thereafter, Alarm C-10, CONTAINMENT RECIRC CLRS WATER OUTLET LO FLOW 1050 GPM, actuates. Conditions are as follows:

- Loop A Service Water pressure is 44 psig and stable.
- Loop B Service Water pressure is 70 psig and stable.
- Containment Sump Level A is 1.9 feet and stable.
- Service water pump discharge pressures are as follows:
    - SWP A: 44 psig
    - SWP B: 44 psig
    - SWP C: 70 psig
    - SWP D: 0 psig
- Containment recirculation fan service water flows are as follows:
    - Fan A: 600 gpm
    - Fan B: 550 gpm
    - Fan C: 1350 gpm
    - Fan D: 1375 gpm

WHAT action should be taken by the crew?

A. Implement ATT-2.2, SW Isolation, and ATT-2.3, SW Loads in CNMT.

B. Implement AP-SW.1, Service Water Leak, and restart the Service Water Pump 'A'.

C. Implement E-0, Reactor Trip or Safety Injection and pull-stop Diesel Generator 'A'.

D. Implement ATT-2.2, SW Isolation, and AP-TURB.5, Rapid Load Reduction.

Answer: B

Explanation/Justification:

A. Incorrect. Wrong because there are no definitive symptoms of a SW leak inside containment that would indicate a need to address a cooler leak. Plausible because applicants may misdiagnose plant conditions and implement ATT-2.2, SW Isolation, which is mentioned as a possible action in AP-SW.1.

B. Correct. The conditions above are trying to create symptoms consistent with SWP 'A's discharge check valve being stuck open. There is a note in AP-SW.1 about a stuck open check valve. Step 3 RNO directs starting a third SWP if pressure is less than 45 psig (implying re-starting SWP A) to address this situation.

C. Incorrect. Wrong because although SW conditions are degraded, they do not meet the criteria to initiate a reactor trip. Plausible because the applicants may confuse the guidance contained in AP-SW.1 (pull-stop effected Diesel Generator) and wrongly go to E-0.

D. Incorrect. Wrong because although SW conditions are degraded, they do not meet the criteria to initiate a controlled shutdown. Plausible because the applicants may confuse the guidance contained in AP-SW.1 (implement Attachment 2.2, SW Isolation) and wrongly go to AB-TURB.5.

Technical References:	AP-SW.1, Service Water Leak	
Proposed References to be provided:	None	
Learning Objective:	R5101C 1.11	
Question Source:	New	
Question History:	Last NRC Exam	N/A

Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 5 55.43 (a) 5 55.45 (a) 3 & 13

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #	059 G2.4.35	
	Importance		4.0

K/A Statement: Main Feedwater - Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects

Question # 89

The plant is at 100% power steady state conditions with all systems in automatic.

Feedwater Pump 1A suction flow instrument fails low.

Which ONE of the following response actions is correct?

A. Initiate power reduction per AP-TURB.5 Rapid Load Reduction, and refer to AR-H-17, Feed Pump Net Positive Suction Head, to close the isolation valve for Condensate Bypass Valve AOV-3959.

B. Enter AP-FW.1, Abnormal MFW Pump Flow or NPSH, start all AFW pumps, initiate power reduction per AP-TURB.5, Rapid Load Reduction and dispatch EO to locally close MFW Pump 'A' Recirc Valve AOV-4147.

C. Initiate power reduction per AP-TURB.5 Rapid Load Reduction, and direct EO to close Main FW Pump Clean-Up Recirc Valve, AOV-4262.

D. Enter AP-FW.1, Abnormal MFW Pump Flow or NPSH, start all AFW pumps, initiate power reduction per AP-TURB.5, Rapid Load Reduction and dispatch EO to locally close the outlet block valve for CNDST Recirc Valve AOV-4238.

Answer: B

Explanation/Justification:

A. Incorrect. Wrong because the referenced alarm response procedure does not direct closing the bypass valve. Plausible because the alarm may actuate and the bypass valve may

open in response to the opening of the pump recirc valve at full power. Differentiating between Choices A and B require detailed SRO level knowledge of the associated procedures.

B. Correct. When the MFW pump suction flow instrument fails low, the associated recirc valve will open and divert feedwater from the SG's. Level deviations and/or flow mismatches will occur prompting the crew to enter AP-FW.1 where the US will need to start all AFW pumps and lower power to a level where feed flow can exceed steam flow.

C. Incorrect. Wrong because although the crew could implement AP-Turb.5 to reduce load, there is no procedural guidance directing the local closure of AOV-4262. Plausible because the applicants may confuse the local closing of AOV-4262 with the guidance to close AOV-4147as well as the fact that AOV-4262 being open is an entry condition for AP-FW.1.

D. Incorrect. Wrong because power is only required to be lowered to a point where feed flow can exceed steam flow. Plausible since V-3957 would be closed to isolate the Condensate Pump Recirc Valve if required by AP-FW.1, Step 11.b RNO.

Technical References:	Big Notes CondFeed Big Notes SGWLCC AP-FW.1, Abnormal MFW Pump Flow or NPSH
Proposed References to be provided:	None
Learning Objective:	R3401C, 1.02, 1.06 and 1.07
Question Source:	New
Question History:	Last NRC Exam N/A
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.41 (b) 10 55.43 (a) 5 55.45 (a) 13

Comments

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		2
	Group #		1
	K/A #		064 G2.2.38
	Importance		4.5

K/A Statement: Emergency Diesel Generator - Knowledge of conditions and limitations in the facility license.

Question # 90

Per Technical Specification Section 3.8 bases, which ONE of the following is a condition that requires declaring EDG 'A' INOPERABLE?

A. EDG 'A' SW AOV-4598G will **NOT** open and the auto open signal for redundant AOV-4598H fails to occur upon diesel auto start.

B. It is determined the level in Fuel Oil Storage Tank 'A' will allow operation of EDG 'A' at its design rating for a maximum of 30 hours.

C. EDG 'A' is operated at a constant load of 2300 kW for 2 hours.

D. An instantaneous load rejection of 300 kW does **NOT** automatically trip EDG 'A'.

Answer: A

Explanation/Justification:

A. Correct. TS 3.8.1 bases lists conditions under which a DG is considered OPERABLE. Item 'h' in that list states "*Two service water AOVs to the diesel generator heat exchangers are OPERABLE (capable of opening) or, either one AOV is open or the manual bypass valve is open.*" For the given condition, the only functional AOV must be maintained open for operability. The valve could be opened to restore operability but it is not open. The EDG is therefore INOPERABLE unless compensatory action is taken to open the AOV.

B. Incorrect. The quantity of stored fuel only needs to support 24 hours at full load. Per TS 3.8.1 Bases, "*Each storage tank provides a minimum fuel oil capacity of 5000 gal. The two storage tanks are sufficient to operate both DGs at design ratings for 24 hours. The total minimum fuel oil capacity also ensures that both DGs can operate for a period of 40 hours while providing for a maximum post loss of coolant accident (LOCA) load demand.*" Plausible because an applicant may confuse the 24 and the 40 hour limitations

C. Incorrect. The EDG is rated at 2250 kW for 2 hours or 2300 for ½ hour. The given load is greater than the specified rated load. While exceeding the rated load limits could result in EDG damage, the Tech Specs and their bases do not establish OPERABILITY on the basis of whether or not the continuous operation limitations have been exceeded. SR 3.8.1.3 requires periodic full load testing at between 2025 kW and 2250 kW for between 1 and 2 hours to verify engine capability. Plausible because the associated basis states the "*upper load band limit of* [less than] *2250 kW is the DG two-hour rating and is provided to avoid routine overloading of the DG which may result in more frequent inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.*"

D. Incorrect. The EDG is <u>required</u> to remain running following a load reject in excess of 295 kW. Plausible if the applicant remembers the threshold value but not the intent of SR 3.8.1.7, which requires the operator to periodically "*Verify each DG does **not** trip during and following a load rejection of* [equal to or greater than] *295 kW.*".

Technical References:	TS Bases 3.8.1 and 3.8.2
Proposed References to be provided:	None
Learning Objective:	R0801C EDGs 1.09
Question Source:	New
Question History:	Last NRC Exam: NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.43 (b) 2

Comments

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	014 A2.04	
	Importance		3.9

K/A Statement: 014A2.04, Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS; and (b) based on those on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Misaligned rod

Question # 91

Assume the following plant conditions following a transient from 100% power:

- 90% power
- Tavg = 569°F
- Group counter Bank D = 205 steps
- MRPI Rod C7 Bank D = 188 steps
- MRPI Rod K7 Bank D = 188 steps
- MRPI Rods G3 and G11 Bank D = 200 steps
- Annunciator C-5, PPCS ROD SEQUENCE OR ROD DEVIATION, alarm lit
- Annunciator F-29, PPCS AXIAL OR QUADRANT POWER TILT, alarm lit
- Rods are believed to be trippable
- The crew has entered AP-RCC.2, RCC/RPI Malfunction

Which one of the following describes the required action per AP-RCC.2?

A. Withdraw control rods to restore Tavg to program

B. Insert Bank D to 200 steps and then realign rods C7 and K7

C. Shutdown per O-2.1, Plant Shutdown To Hot Shutdown

D. Perform applicable portions of STP-O-1, Rod Control System

Answer: C

Explanation/Justification:

A. Incorrect. Plausible because control rod insertion is allowed for temperature control, but withdrawal is NOT allowed. Incorrect because with Tavg low, turbine load would be adjusted (lowered) to raise Tavg back to Tref value.

B. Incorrect. Plausible if the applicant is not familiar with rod alignment indications and AP-RCC.2, and believes rod K7 meets alignment requirements (within 12 steps of G3 and G11) and there is a single misaligned rod. Incorrect because alignment is MRPI compared to the associated step counter.

C. Correct. Per ITS 3.1.4, Shutdown and control rods are OPERABLE if the rod is within alignment and trippable. They are INOPERABLE because they don't meet the surveillance requirement for alignment. AP-RCC.2 requires a load reduction for a single misaligned rod and a plant shutdown for >1 rod misaligned.

D. Incorrect. Plausible because AP-RCC.2 directs verification of control rod operability per STP-0-1 during post rod recovery. Incorrect because this action would be valid only for a single misaligned rod. With 2 misaligned rods, a shutdown per 0-2.1 is required.

Technical References:	AP-RCC.2
Proposed References to be provided:	None
Learning Objective:	R3001C 1.06,1.10,&1.11
Question Source:	Bank
Question History:	Last NRC Exam NA
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	035 A2.01	
	Importance		4.6

K/A Statement: 035A2.01, Ability to (a) predict the impacts of the following malfunctions or operations on the GS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Faulted or ruptured S/Gs

Question # 92

Given the following plant conditions:

- A reactor trip and safety injection have occurred.
- RCS pressure is 1600 psig and LOWERING.
- PZR level is offscale LOW.
- Tavg is 500°F and LOWERING.
- Containment pressure is 10 psig and RISING.
- SG "A" pressure is 620 psig and LOWERING.
- SG "B" pressure is 600 psig and LOWERING.

Which of the following procedure flowpaths will be used to mitigate the event following E-0, "Reactor Trip or Safety Injection"?

A. E-1, "Loss of Reactor or Secondary Coolant" and then E-2, "Faulted Steam Generator Isolation."

B. E-2, "Faulted Steam Generator Isolation" and then E-1, "Loss of Reactor or Secondary Coolant."

C. E-2, "Faulted Steam Generator Isolation" and then ECA 2.1, "Uncontrolled Depressurization of Both Steam Generators."

D. E-1, "Loss of Reactor or Secondary Coolant" and then ECA 2.1, "Uncontrolled Depressurization of Both Steam Generators."

Answer: C

Explanation/Justification:

A. Incorrect
Plausible due to E-1 is entered from E-0 and if applicant does not assess step 15 of E-0 correctly and enter E-1 from step 17.

B. Incorrect.
Plausible if applicant assess step 15 of E-0 correctly but does not assess that both steam generators are faulted and determines need to go to E-1 based on E-2.

C. Correct.
E-2 is entered from E-0, momentarily and then transitioned to ECA 2.1 based on step 2, both steam generators are faulted.

D. Incorrect.
Transition to ECA 2.1 occurs from E-2. E-1 would not be entered due to the size of the breaks.

Technical References:	E-0, E-1, E-2, & ECA 2.1 (Procedures and Bases)	
Proposed References to be provided:	None	
Learning Objective:	REP02C 1.2, 2.1	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8	

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		2
	Group #		2
	K/A #	055 G2.4.21	
	Importance		4.6

K/A Statement: G2.4.21, Knowledge of the parameters and logic used to assess the status of safety functions including:
1. Reactivity control
2. Core cooling and heat removal
3. Reactor coolant system integrity
4. Containment conditions
5. Radioactivity release control.

Question # 93

Given the following plant conditions:

- A Steam Generator Tube Rupture is in progress.
- Complications were observed while performing E-3, Steam Generator Tube Rupture.
- The crew is performing ECA-3.2, SGTR with Loss of Reactor Coolant - Saturated Recovery Desired.
- SI Pumps 'A' and 'C' are running.
- RCS subcooling is 0°F.
- RCP 'B' is running.
- RCS fluid fraction is 55%.
- PRZR level is off-scale low.

Which ONE of the following describes the condition of the INVENTORY CSF Status Tree, and the required and/or acceptable action for the condition?

NOTE: **FR-I.2, Response to Low Pressurizer Level**
FR-I.3, Response to Voids in the Reactor Vessel

INVENTORY CSF Status Tree is ...

A. GREEN because SI Pumps are running. If the SI Pumps fail, the US will remain in ECA-3.2 because FR-I.2 should not be performed.

B. YELLOW because Pressurizer level is low. FR-I.2, may be performed at the discretion of the US.

C. YELLOW due to voiding in the Reactor Vessel. FR-I.3 may be performed at the discretion of the US.

D. YELLOW due to voiding in the Reactor Vessel. If due to cooldown, the US will remain in ECA-3.2, because FR-I.3 should not be performed.

Answer: A

Explanation/Justification:

A. Correct. Yellow Path for Inventory will not exist if SI is in service. And FR-I.2 will not be entered if path turns yellow because ECA-3.2 takes precedence.

B. Incorrect. Yellow Path does not exist with SI pumps running, and action would be normal for yellow conditions, but not for current conditions.

C. Incorrect. Plausible because there is a low water density, but with RCP running, FR-I.1 cannot be reached.

D. Incorrect. Plausible because there is a low water density, but with RCP running, FR-I.1 cannot be reached. However, actions are correct for this conditions

Technical References:	F-0,2, Inventory CSFST	
Proposed References to be provided:	None	
Learning Objective:	RFRI3C 2.01, 1.01	
Question Source:	Bank	
Question History:	Last NRC Exam	2010 NRC Exam
Question Cognitive Level:	Comprehension	
10 CFR Part 55 Content:	55.43 (b) 5	
Comments:		

EXAMINATION

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.1.36	
	Importance		4.1

K/A Statement: Knowledge of procedure and limitations involved in core alterations.

Question # 94

Given the following plant conditions:

- The upper internals are being lifted
- The equipment hatch is removed
- The roll up door is capable of being closed under administrative control

Which of the following choices correctly completes the statement?

Per Tech Specs, the roll up door must be capable of being closed ____(1)____ and, with the roll up door fully closed, S-23.2.2, Containment Purge, guidelines pertaining to operation of the system, allows a purge fan operating configuration of _____(2)_____ supply fan(s) and ONE exhaust fan running.

A. (1) within 30 minutes
   (2) NO

B. (1) within 30 minutes
   (2) ONE

C. (1) within 1 hour
   (2) NO

D. (1) within 1 hour
   (2) ONE

Answer: B

Explanation/Justification:

A. Incorrect. Part 1 is correct. Part 2 is plausible since this is an allowed Containment Purge system configuration with the roll up door OPEN.

B. Correct. Part 1: In accordance with Tech Spec Bases LCO 3.9.3 "Both equipment hatch air lock doors, the closure plate door, or the enclosure building rollup door may remain open if able to be closed under administrative control within 30 minutes." Additionally, The LCO requirements are referred to as "containment closure" rather than "containment OPERABILITY. Containment closure means that all potential escape paths are closed or capable of being closed." Part 2: Step 5.13 of S23.2.2 states "*when the roll-up door is fully closed, purge supply must be run if purge exhaust is to be run. Operation of just the Purge Exhaust Fan can damage the door due to the differential pressure.*"

C. Incorrect. Part 1 is plausible because 1 hour is a very common time limitation throughout the technical specifications, including Condition B of LCO 3.6.3, Containment Isolation Boundaries. Additionally, 1 hour might reasonably, but incorrectly, be assumed to be the time limit. Part 2 is plausible since this is an allowed CNMT Purge system configuration with the roll up door OPEN. Also, S23.2.2 Precaution 4.3 states fans should be operated in a configuration to maintain a negative pressure in containment.

D. Incorrect. Part 1 is plausible because 1 hour is a very common time limitation throughout the technical specifications, including Condition B of LCO 3.6.3, Containment Isolation Boundaries. Additionally, 1 hour might reasonably, but incorrectly, be assumed to be the time limit. Part 2 is correct.

Technical References:	TS & Bases LCO 3.9.3 S-23.2.2, Step 5.13	
Proposed References to be provided:	None	
Learning Objective:	R3701C 1.12 & 1.13	
Question Source:	New	
Question History:	Last NRC Exam	NA
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.43 (b) 6	
Comments:		

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.1.42	
	Importance		3.4

K/A Statement: G2.1.42, Knowledge of new and spent fuel movement procedures.

Question # 95

Given the following plant conditions:

- The plant is in MODE 6.
- Core off-load is in progress.
- The New Fuel Elevator is being used for temporary storage of an irradiated fuel assembly.

Which ONE of the following describes the restrictions placed on refueling activities in this condition?

A. Concurrent fuel movement in the SFP must be pre-approved by a Fuel Handling Deviation. Fuel movement in Containment may continue with the exception of placing irradiated assemblies in the Fuel Transfer Cart.

B. All fuel handling activities must be discontinued in the SFP AND Containment.

C. All movement of irradiated fuel within the SFP AND Containment must be pre-approved by a Fuel Handling Deviation.

D. Concurrent fuel movement in the SFP is NOT allowed. Refueling activities in Containment may continue.

Answer: D

Explanation/Justification:

A. Incorrect. Plausible because having an assembly is an abnormal condition and the applicant may believe that the transfer cart may not be sent to the SFP.

B. Incorrect. Plausible because activities may not proceed in SFP, and it is logical to assume that all fuel movement would be stopped.

C. Incorrect. Plausible because this is an abnormal condition, and abnormal movements would normally be approved with a deviation.

D. Correct. Per RF-301, P&L 4.14 Fuel movement within the SFP is NOT allowed when an irradiated fuel assembly is located in the new fuel elevator.

Technical References:	RF-301
Proposed References to be provided:	None
Learning Objective:	R3701C 1.09
Question Source:	Bank
Question History:	2011 SRO Retake Examination
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.41 (b) 8 55.43 (b) 8

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.2.18	
	Importance		3.9

K/A Statement: Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.

Question # 96

Given the following plant conditions:

- RCS reduced inventory operation is in progress.
- Time to Boil is 15 minutes.
- 3 Responsible Individuals are assigned to the Containment Closure Deviation Status:
  - Operator A - total of 5 minutes assigned
  - Operator B - total of 12 minutes assigned
  - Operator C - total of 13 minutes assigned
- A new open CNMT Penetration #10 is about to be established and assigned to Operator A.
- Estimated closure time of Penetration #10 is 7 minutes.

After Operator A is assigned an additional action to close Penetration #10, WHICH ONE of the following identifies 1) the effect on the Most Limiting Total Estimated Closure (ML TEC) Time, **AND** 2) the MAXIMUM allowable ML TEC?

The ML TEC time will __(1)__ and the MAXIMUM allowable ML TEC time is __(2)__ minutes.

A. (1) remain the same
   (2) 15

B. (1) remain the same
   (2) 120

C. (1) rise
   (2) 15

D. (1) rise
   (2) 120

Answer: A

Explanation/Justification:

A. Correct: 1st part correct, 2nd part correct. According to Attachment 1 of 0-2.3.1A (p61-63, Rev 027) the ML TEC will remain at 13 minutes because there are three individuals that are assumed to be working in parallel, and Operator C has a total of 13 minutes. Consequently, the Operator C work is the most limiting. Also according to Attachment 1 of 0-2.3.1A (p61-63; Rev 027), the ML TEC must be less than 120 minutes or the Time-To-Boil (whichever is less)..

B. Incorrect: 1st part wrong, 2nd part wrong. See A and D.

C. Incorrect: 1st part correct, 2nd part wrong. This is incorrect because the maximum ML TEC is 15 minutes, not 120 minutes. This is plausible because procedurally the maximum ML TEC can be as high as 120 if the Time-To-Boil were greater than 2 hours.

D. Incorrect: 1st part wrong, 2nd part correct. This is incorrect because ML TEC will remain the same, not rise. This is plausible because the operator may not understand the concept of ML TEC

Technical References:	O-2.3.1A, Attachment 1, Rev 027
Proposed References to be provided:	None
Learning Objective:	ROP14C 1.02
Question Source:	Bank
Question History:	Last NRC Exam Ginna 2014 Q96
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.43 (b) 5

Comments:

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.2.6	
	Importance		3.6

K/A Statement: Knowledge of the process for making changes to procedures

Question # 97

Given the following plant conditions:

- The crew is in the process of implementing an Emergency Contingency Action (ECA) procedure.
- The crew notes that procedure steps providing guidance to prevent damage to plant equipment are 15 steps later in the procedure.
- The US estimates 20 minutes to complete these steps as sequenced.
- The TSC has determined this action has to be taken 10 minutes from now.
- Action by the crew is desired to perform the prescribed EOP step earlier than the actual step sequence.

Which one of the following describes the process which must be used to perform the desired action?

A. OP-AA-101-1006, Operational Decision-Making Process

B. 10CFR50.54(x) actions, departure from license conditions or technical specifications conditions

C. AD-AA-101, Processing of Procedures and T&RMs

D. A-503.1, Emergency and Abnormal Operating Procedure Users Guide

Answer: D

Explanation/Justification:

A. Incorrect: Plausible because EOPs are required to be performed in the prescribed step sequence, however there are exceptional conditions as described in the A-503.1 WOP Procedure Users Guide, Performing Steps Out of Sequence ...

B. Incorrect: Plausible because while the 10 CFR 50.54(x) departure from license conditions or technical specifications is used for changes, which use a different strategy than the EOP when conditions exist that need to be addressed and no apparent procedural guidance exists.

C. Incorrect: The purpose of AD-AA-101 is to "Control the process for the development and alteration of sit1e-specific administrative and technical procedures, including EOPs, AOPs, and SOPs. Sufficient time does not exist to process an Immediate Change to the ECA in progress.

D. Correct: Section 5.3.A, Procedure Deviations, addresses procedural deviations where the written guidance provided in the step is not appropriate for the event at hand or is non-conservative. Moving a step, or performing a step out of order is considered a procedure deviation and may only be considered when all 3 conditions are met: (1) as written guidance is deficient due to current plant or equipment conditions, (2) insufficient time exists to implement the normal procedure change policy, and (3) an immediate need exists to prevent or minimize injury to personnel, damage to plant equipment, or a threat to health and safety of the public. The given conditions meet these criteria.

Technical References:	AD-AA-101, A-503.1	
Proposed References to be provided:	None	
Learning Objective:	RAD07C 3.01	
Question Source:	Bank	
Question History:	Last NRC Exam	Ginna 2014 Q95
Question Cognitive Level:	Fundamental	
10 CFR Part 55 Content:	55.43 (b) 3	

Comments: Matches the KIA by requiring knowledge of which procedural process addresses making a change to an ECA procedure.
SRO-only because it requires knowledge of the procedural process for changing plant procedures

EXAMINATION

2018 Ginna NRC Exam

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.3.6	
	Importance		3.8

K/A Statement: Ability to approve release permits

Question # 98

The "A" Monitor Tank was sampled at 1700 on Monday and the analysis was completed for subsequent release.

Considering the four times listed below, which of the choices identifies **ALL** of the times at which the release could be initiated without additional approval?

1. 1900 Monday
2. 2300 Monday
3. 0400 Tuesday
4. 1700 Tuesday

A. 1 ONLY

B. 1 and 2 ONLY

C. 1, 2, and 3 ONLY

D. 1, 2, 3, and 4

Answer: C

Explanation/Justification:

A. Incorrect: Although this falls within the 12 hours limit, it does not identify ALL of the times at which the release could be initiated with no restrictions.

B. Incorrect: Although this falls within the 12 hours limit, it does not identify ALL of the times at which the release could be initiated with no restrictions.

C. Correct: Per S-3.4K, the release may be initiated, provided no more than 12 hours have elapsed since the sample. 1, 2, and 3 are all within 12 hours of the 1700 Monday sample.

D. Incorrect: At time 4 there is a restriction: The release may only be initiated, with Chem Tech approval, provided the conditions that existed when the permit was made still exist.

Technical References:	CH-700
Proposed References to be provided:	None
Learning Objective:	RSE00S, 5.04
Question Source:	Bank
Question History:	Last NRC Exam Ginna 2012 Q#92
Question Cognitive Level:	Fundamental
10 CFR Part 55 Content:	55.43 (b) 4
Comments:	

Question #99 is withheld from public release.

Exam Outline Cross Reference:	Level	RO	SRO
	Tier #		3
	Group #		
	K/A #	G2.4.40	
	Importance		4.5

K/A: Knowledge of SRO responsibilities in emergency plan implementation

Question # 100

Given the following plant conditions:

- A Steam Generator Tube Rupture (SGTR) occurs; the US orders a reactor trip and SI.
- Operators are unable to trip the reactor from the Control Room, resulting in an Anticipated Transient Without Scram (ATWS)
- An EO successfully trips the reactor locally.
- The Atmospheric Relief (ARV) on the ruptured S/G cycles multiple times until the RCS cooldown commences.

Which one of the following identifies the highest classification **AND** the reason for the classification?

A. SITE AREA EMERGENCY due to SGTR w/ARV cycling.

B. SITE AREA EMERGENCY due to ATWS.

C. ALERT due to ATWS.

D. ALERT due to SGTR w/ARV cycling.

Answer: B

Explanation/Justification:

A. Incorrect: Cycling ARV is not a loss of Containment barrier

B. Correct:

C. Incorrect: ATWS no trip from CR is SAE

D. Incorrect: events are not combined

Technical References:	EP-AA-1012, Addendum 3
Proposed References to be provided:	None
Learning Objective:	RSC02C 3.00
Question Source:	New
Question History:	Last NRC Exam NA
Question Cognitive Level:	Comprehension
10 CFR Part 55 Content:	55.43 (b) 5
Comments:	