GGNS LOT 2012 NRC INITIAL LICENSED OPERATOR WRITTEN EXAMINATION
RO EXAM

ANSWER KEY

1	A		26	B		51	B
2	B		27	A		52	B
3	D		28	D		53	C
4	C		29	B		54	C
5	D		30	A		55	A
6	B		31	B		56	C
7	A		32	C		57	A
8	A		33	B		58	D
9	D		34	A		59	B
10	B		35	D		60	D
11	C		36	D		61	A
12	C		37	C		62	D
13	B		38	D		63	C
14	A		39	B		64	C
15	D		40	D		65	A
16	C		41	A		66	B
17	C		42	C		67	C
18	A		43	D		68	C
19	B		44	B		69	D
20	A		45	A		70	B
21	C		46	A		71	D
22	A		47	C		72	D
23	C		48	A		73	B
24	C		49	D		74	A
25	D		50	A		75	B

Examination Outline Cross-Reference	Level	RO
218000 ADS Knowledge of electrical power supplies to the following: K2.01 ADS logic	Tier #	2
	Group #	1
	K/A #	218000 K2.01
	Rating	3.1
	Rev / Date	0 / 10-12-2012

Question 1

The Div 1 ADS logic is powered from…

A. Distribution panel 1DA1.

B. RPS Bus ‘A’.

C. Inverter 1Y87.

D. Power panel 15P61.

Answer: A

Explanation:

‘A’ is correct. ADS logic is DC powered from the Div 1 DC subsystem (11DA) via its distribution panel 1DA1, breaker 72-11A23 (see E-1161-004 and -005, also E-1023).

‘B’ is wrong. RPS Bus ‘A’ supplies 120 VAC, not 125 DC. Plausible to the Applicant who cannot recall that ADS logic is DC powered.

‘C’ is wrong. This is the Div 1 inverter which supplies 120 VAC, not 125 DC. Plausible for the same reason as choice ‘B’.

‘D’ is wrong. This is one of the 120 VAC power panels fed from the Div 1 vital bus 15AA via an MCC. Plausible for the same reason as choice ‘B’.

Technical References:

E-1023, One Line for 125 VDC Buses 11DA, 11DB & 11DC
E-1161-004, ADS Power Distribution
E-1161-005, ADS Relay Logics

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-E2202, Objective 19.3

Question Source:	Bank #	

(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(8)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
223002 PCIS/Nuclear Steam Supply Shutoff G2.1.28 Knowledge of the purpose and function of major system components and controls.	Tier #	2
	Group #	1
	K/A #	223002 G2.1.28
	Rating	4.1
	Rev / Date	1 / 11-18-2012

Question 2

Depressing the CTMT-DRWL ISOL DIV 1(2) MAN INIT isolation pushbuttons on P870 will isolate the…

A. RHR to Radwaste Group 2 valves.

B. Containment Cooling Group 7 valves.

C. RWCU Group 8 valves.

D. Reactor Water Sample Line Group 10 valves.

Answer: B

Explanation:

'B' is correct. Only the Group 7 valves isolate when these pushbuttons are depressed. The list of the valves that close when these pushbuttons are depressed is found in the M71 system SOI, page 6, Section 5.1.2. Compare this list to the Containment Cooling Group 7 list found in the "Automatic Isolations" ONEP (05-1-02-III-5) to validate that only Group 7 valves will close.

For the reasons listed above, only answer B can be correct. The plausibility of the other answer choices is that each of these groups of NSSSS isolations contain penetrations/valves within the Drywell and/or Containment. The name plate description for the Group 7 isolation is not detailed enough for someone who has not mastered the knowledge of the purpose/function of this isolation to distinguish between these isolation groups.

Technical References:

CTMT and Drywell Instrumentation and Control System SOI, 04-1-01-M71-1
Automatic Isolations ONEP, 05-1-02-III-5

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-M7101, Objective 8.2

Question Source:	Bank #	

(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
300000 Instrument Air Ability to manually operate and / or monitor in the control room: A4.01 Pressure gauges	Tier #	2
	Group #	1
	K/A #	300000 A4.01
	Rating	2.6
	Rev / Date	0 / 10-12-2012

Question 3

The plant is operating at rated power with **no** Instrument Air System problems.

Which of the following identifies the control room panel where operators can read INSTRUMENT AIR SUPPLY HEADER PRESSURE, and identifies what that indicator normally reads?

A. Panel P854; normally reads approximately 135 psig

B. Panel P854; normally reads approximately 110 psig

C. Panel P870; normally reads approximately 135 psig

D. Panel P870; normally reads approximately 110 psig

Answer: D

Explanation:

'D' is correct. There is only one Instrument Air Supply Header Pressure indicator in the control room; it is located on P870 and normally reads about 110 psig. See 02-S-01-31, Control Room Rounds two sheets (one for Instrument Air at P870 page 15 of 40, the other for Service Air at P854 page 13 of 40).

'A', 'B', and 'C' are wrong for the reason 'D' is correct. Panel P854 is plausible because that is where operators control two of the Plant Air Compressors (PAC 'B' and 'C') and is the location of the indicator for Service Air Header Pressure. 135 psig is plausible because this is the "unload" setpoint for the in-service ("LEAD") PAC.

Technical References:

GLP-OPS-P5100, Plant Air System lesson
eSOMS Suite Operator Rounds (Control Room), two sheets…one showing P870 Instrument Air pressure, the other showing P854 Service Air pressure (**hardcopy** attached with this question)

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-P5100, Objective 18.0			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(4)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
239002 SRVs Knowledge of the physical connections and/or cause-effect relationships between RELIEF/SAFETY VALVES and the following: K1.04 Main steam	Tier #	2
	Group #	1
	K/A #	239002 K1.04
	Rating	3.6
	Rev / Date	0 / 10-12-2012

Question 4

The plant is operating at rated power when a single SRV opens fully (due to a relief mode failure).

How does the Total Main Steam Flow indication at P680 respond and how do the Turbine Control Valves (TCVs) respond?

A. Indicated Total Main Steam Flow rises.
TCVs throttle in the closed direction.

B. Indicated Total Main Steam Flow rises.
TCVs throttle in the open direction.

C. Indicated Total Main Steam Flow lowers.
TCVs throttle in the closed direction.

D. Indicated Total Main Steam Flow lowers.
TCVs throttle in the open direction.

Answer: C

Explanation:

See P&IDs M-1077A for the physical relationship between the SRVs and the MSL flow elements; the SRVs are upstream. Thus, an open SRV (discharging to the suppression pool) robs steam flow away from the MSL and its flow element. Therefore, indicated Total Main Steam Flow (at P680) lowers. The steam pressure sensed at the main steam equalizing header also lowers, causing the EHC system's IPC (pressure regulator) to respond by throttling the TCVs in the closed direction in an effort to restore steam pressure back to "Pressure Reference", and in doing so restore reactor pressure back to normal rated pressure.

For these reasons, 'C' is correct.

'A', 'B', 'D' are wrong for the reasons 'C' is correct. Plausibility is based on the Applicant's need to recall where the SRVs are with respect to the MSL flow elements, and his need to recall how steam pressure responds to the open SRV.

Technical References: P&ID M-1077A, Nuclear Boiler System			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-E2202, Objective 6.1			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(8)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295005 Main Turbine Generator Trip / 3 Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: AK3.07 Bypass valve operation	Tier #	1
	Group #	1
	K/A #	295005 AK3.07
	Rating	3.8
	Rev / Date	0 / 10-12-2012

Question 5

The plant is operating at 20% power when a main generator lockout causes a main turbine trip.

How do the Turbine Bypass Valves (TBVs) respond and why?

A. All 3 remain closed because the Lo-Lo Set SRVs begin to control reactor pressure.

B. Only the #1 valve opens to about 2% open because the Lo-Lo Set SRVs are predominantly controlling reactor pressure.

C. Only the #1 and #2 valves throttle open because the reactor is producing only 20% steam.

D. After the #1 valve is about 2% open then all 3 valves throttle open together to control reactor pressure because they are designed to operate in unison.

Answer: D

Explanation:

At only 20% power (well below the Turbine Trip Reactor Scram enabled setpoint of 35.4%; see RPS Instrumentation LCO Table 3.3.1.1-1, Functions 9 and 10), the reactor remains operating producing about 20% steam. GGNS total bypass capacity is about 35% steam. When the turbine trips (i.e., Turbine Stop Valves and Turbine Control Valves close), the EHC system's Initial Pressure Controller (IPC) will begin to use the Bypass Control Units (BCUs) to maintain reactor pressure at its original setpoint. The 3 BCUs (one for each TBV) at GGNS are designed to throttle the 3 TBVs in unison, rather than in sequence, to control reactor pressure…with one exception, TBV #1 is designed to open to about 2% open before #2 and #3 throttle open, <u>but then</u> all 3 uniformly position to control pressure.

'A' is wrong. With only 20% steam being produced and a 35% bypass capacity, pressure will not rise to the point of actuating the Lo-Lo Set SRV function. Plausible to an Applicant who cannot recall the bypass capacity.

'B' is wrong. The reason is similar to choice 'A'. And plausible for similar reasons. The suggestion of the #1 valve opening to 2% adds to the discriminating value of this choice for the weak Applicant who vaguely recalls something about how the BCUs have the #1 valve open 2%.

‘C’ is wrong. This choice suggests that the 3 valves throttle open in sequence as much as needed to absorb the 20% steam load (as is the case at many other BWRs); this is not the GGNS design (as already described). Plausible to an Applicant who cannot recall this design detail. ‘D’ is correct for the reasons already described.			
Technical References: Turbine Generator Vendor Manual, 460000665, specifically section 1.1-2130.			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-N3202, Objectives 9.1, 9.2			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(5)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295023 Refueling Acc / 8 G2.1.27 Knowledge of system purpose and/or function.	Tier #	1
	Group #	1
	K/A #	295023 G2.1.27
	Rating	3.9
	Rev / Date	0 / 10-12-2012

Question 6

A spent fuel bundle has been dropped and damaged in the Fuel Handling Area, causing all 4 Fuel Handling Area Ventilation Exhaust radiation monitoring channels to peak at 3.8 mR/hr.

Three minutes later, which of the following describes the design function(s) of the system(s) that is/are ventilating the secondary containment?

A. Maintaining all of secondary containment at a negative d/p relative to the outside atmosphere; no additional functions being performed.

B. Maintaining all of secondary containment at a negative d/p relative to the outside atmosphere; is also limiting the thyroid dose at the site boundary to within 10 CFR guidelines.

C. Maintaining only the Fuel Handling Area at a negative d/p relative to the outside atmosphere; no additional functions being performed.

D. Maintaining only the Fuel Handling Area at a negative d/p relative to the outside atmosphere; is also limiting the Total Effective Dose Equivalent (TEDE) at the site boundary to within 10 CFR guidelines.

Answer: B

Explanation:

At 3.6 mR/hr in the Fuel Handling Area Ventilation Exhaust, Standby Gas Treatment (SGTS) auto-initiates and isolates the normal secondary containment ventilation systems (Fuel Handling Area Ventilation (T42) and Auxiliary Building Ventilation (T41); see EP-4, Auxiliary Bldg Control, step 1). SGTS draws down (in approximately 2 minutes) all of the secondary containment atmosphere (Fuel Handling Area/Aux Bldg/Enclosure Bldg) to an approximate -0.25” w.c. d/p relative to outside atmospheric pressure; the SGTS Exhaust Filter Trains (which include charcoal adsorbers to scrub iodine) act to limit both the TEDE dose release and the thyroid dose release.

‘A’ is wrong. This choice suggests that the normal ventilation systems (T41 and T42) are still in service, in which case, they only be ventilating while maintaining the negative d/p.

‘B’ is correct. As already described above, SGTS has gone into service and is maintaining the

negative d/p while also limiting offsite doses (including the thyroid dose) via its Exhaust Filter Trains.

'C' is wrong. This choice suggests that the normal secondary containment ventilation systems are still in service, but they are maintaining the negative d/p for the Fuel Handling Area, only.

'D' is wrong. This choice suggests that SGTS has gone into service (limiting the TEDE dose release) but is maintaining the negative d/p on the Fuel Handling Area, only.

Technical References:

05-S-01-EP-4, Auxiliary Building Control
Tech Spec LCO 3.6.4.3, Standby Gas Treatment System
Tech Spec 3.6.4.3 Bases

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-T4801, Objectives 1.0, 2.0

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295027 High Containment Temperature / 5 G2.2.38 Knowledge of conditions and limitations in the facility license.	Tier #	1
	Group #	1
	K/A #	295027 G2.2.38
	Rating	3.6
	Rev / Date	0 / 10-12-2012

Question 7

Tech Spec LCO 3.6.1.5, Primary Containment Air Temperature is Applicable in ___(1)___ and limits the temperature to no higher than ___(2)___.

A. (1) Modes 1, 2, and 3
   (2) 95°F

B. (1) Modes 1 and 2, only
   (2) 95F

C. (1) Modes 1, 2, and 3
   (2) 135°F

D. (1) Modes 1 and 2, only
   (2) 135°F

Answer: A

Explanation:

See LCO 3.6.1.5. Applicable in Modes 1, 2, and 3. The LCO limits Containment Air Temperature to no higher than 95°F.

For these reasons only choice 'A' is correct.

'B' is wrong because it excludes Mode 3 from its Applicability.

'C' and 'D' are wrong. They both suggest the limit is 135°F which is the LCO limit for Drywell Air Temperature, which makes these choices plausible.

Technical References:

Tech Spec LCO 3.6.1.5, Primary CTMT Air Temperature
Tech Spec LCO 3.6.5.5, Drywell Air Temperature

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-M4101, Objective 11

Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295028 High Drywell Temperature / 5 Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: EK2.02 Components internal to the drywell	Tier #	1
	Group #	1
	K/A #	295028 EK2.02
	Rating	3.2
	Rev / Date	0 / 10-12-2012

Question 8

EP-3 (Containment Control) directs operators to emergency depressurize if drywell temperature cannot be maintained below 330 °F.

This specific temperature is the drywell design temperature; however, a temperature of 340 °F would challenge the ability of certain components within the drywell to operate as designed.

Per the EP Technical Bases, what are those components?

A. SRVs

B. MSIVs

C. Drywell Purge Supply/Initial Vacuum Relief Valves

D. Post-LOCA Vacuum Valves

Answer: A

Explanation:

See EP Tech Bases, Attachment VI, page 12 of 34, for EP-3, Step DWT-5.

Only choice ‘A’ is correct.

‘B’, ‘C’, and ‘D’ are for the reason ‘A’ is correct. They are plausible because each of these components is either in, or interface with the drywell.

Technical References:

02-S-01-40, EP Technical Bases

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-EP3, Objective 7

Question Source:	Bank #	

(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
209001 LPCS Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) and/or interlocks which provide for the following: K4.02 Prevents water hammer	Tier #	2
	Group #	1
	K/A #	209001 K4.02
	Rating	3.0
	Rev / Date	0 / 10-12-2012

Question 9

Which of the following is designed to prevent water hammer in the LPCS system?

A. LPCS Pump Discharge Restricting Orifice, E21-RO-D002

B. LPCS Pump Discharge Check Valve, E21-F003

C. LPCS Testable Check Valve, E21-F006

D. LPCS Jockey Pump, E21-C002

Answer: D

Explanation:

‘A’ is wrong because its purpose is to prevent pump runout at low discharge pressures.

‘B’ is wrong because its purpose is to prevent backflow through the pump.

‘C’ is wrong because its purpose is to act as a PCIV.

‘D’ is correct because the jockey pump prevents water hammer by keeping the injection filled and pressurized between the pump discharge check valve and the injection valve (F005).

‘A’, ‘B’, and ‘C’ are all plausible because they are components found in the LPCS pump discharge line.

Technical References:

M-1087, LPCS P&ID
Tech Spec LCO 3.5.1, ECCS Operating
Tech Spec Bases B 3.5.1, page B 3.5-9, SR 3.5.1.1 discussion

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-E2100, Objective 4.5

Question Source:	Bank #	

(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
211000 SLC Knowledge of the physical connections and/or cause-effect relationships between STANDBY LIQUID CONTROL SYSTEM and the following: K1.05 RWCU	Tier #	2
	Group #	1
	K/A #	211000 K1.05
	Rating	3.4
	Rev / Date	0 / 10-12-2012

Question 10

Both SLC Pumps have been started from the control room.

How many total RWCU (G33) isolation valves have received a CLOSE signal?

A. 2

B. 3

C. 4

D. 5

Answer: B

Explanation:

Starting the 'A' SLC pump sends a CLOSE signal to RWCU isolation valve G33-F004. Starting the 'B' SLC pump sends a CLOSE signal to RWCU isolation valves G33-F001 and F251. Thus, a total of 3 valves receive a CLOSE signal (see the SLC system SOI, Attachment VI hardcard).

'B' is correct for the reason described above.

'A', 'C', and 'D' are wrong for the reason 'C' is correct. Their plausibility is premised on the Applicant having to recall which valve(s) are associated with each SLC pump.

Technical References:

04-1-01-C41-1, SLC System SOI

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-C4100, Objective 11

Question Source:	Bank #	

(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295008 High Reactor Water Level / 2 Knowledge of the interrelations between HIGH REACTOR WATER LEVEL and the following: AK2.06 RCIC	Tier #	1
	Group #	2
	K/A #	295008 AK2.06
	Rating	3.4
	Rev / Date	1 / 11-14-2012

Question 11

The reactor is at 935 psig Reactor pressure following a scram.

RCIC is maintaining reactor water level with an upward trend in level.

EP Attachment 3, Defeating all RCIC isolation and non-mechanical turbine trip interlocks, is installed.

As reactor water level rises to +53.5”…

A. The RCIC Trip/Throttle Valve will remain open
E51-F013, RCIC injection valve will close

B. The RCIC Trip/Throttle Valve will close
E51-F013, RCIC injection valve will close

C. The RCIC Trip/Throttle Valve will remain open
E51-F013, RCIC injection valve will remain open

D. The RCIC Trip/Throttle Valve will close
E51-F013, RCIC injection valve will remain open

Answer: C

Explanation:

For normal RCIC operation the trip/throttle valve only closes for a trip condition (electrical or mechanical) otherwise it is in the position defined by the governor control system (see vendor manual 460004100). Since water level isolation is not a mechanical trip, with EP attachment 3 installed this valve will not close.

The E51-F013 will automatically shut when either the trip/throttle valve shuts (on a trip) or when the E51-F045 shuts (on Level 8). See E51-K93 (E-1185-34 high level bypassed by att 3 step 2.10). Therefore, with attachment 3 installed the E51-F013 will not close on high water level.

For these reasons, choice ‘C’ is correct.

‘A’ and ‘B’ is wrong. They suggest that E51-F013 will close. A weak candidate may falsely believe that RCIC will continue to function normally to maintain reactor water level. ‘D’ is also incorrect since the trip/throttle valve would not close for high level to begin with. This valve would only close for a trip signal. A weak candidate may confuse the E51-F045 closure at 53.5” with a trip/throttle valve closure.
Technical References: 04-1-01-E51-1, RCIC System SOI, Section 5.2 460004100, Terry Turbine Controls Maintenance Guide E-1185-002, RCIC Injection Valve F013 control drawing E-1185-006, RCIC Steam Supply to Turbine Valve F045 control drawing E-1185-34, RCIC Logic Circuit
References to be provided to applicants during exam: None
Learning Objective: GLP-OPS-E5100, Objective 21

Question Source:	Bank # GGNS-OPS-01827	X	
(note changes; attach parent)	Modified Bank #		
	New		
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295010 High Drywell Pressure / 5 Knowledge of the operational implications of the following concepts as they apply to HIGH DRYELL PRESSURE: AK1.03 Temperature increases	Tier #	1
	Group #	2
	K/A #	295010 AK1.03
	Rating	3.2
	Rev / Date	0 / 10-12-2012

Question 12

The plant is operating at rated power when Plant Service Water is lost to the drywell chillers.

In this situation, drywell pressure would be controlled by…

A. Placing the Containment Cooling System in the drywell purge mode of operation.

B. Manually initiating SGTS.

C. Aligning SSW to the drywell chillers.

D. Manually initiating the Drywell Purge Subsystem of the Combustible Gas Control System.

Answer: C

Explanation:

'A' is wrong. This is an acceptable means of controlling drywell pressure only in Modes 3, 4 and 5. See 04-1-01-M41-1, Section 5.2. Plausible to the Applicant who cannot recall this detail.

'B' is wrong. With the plant in Mode 1 (at rated power), Primary Containment is in effect (not relaxed), so there is no interface between SGTS ventilation and the Containment; thus SGTS can not affect drywell conditions. Plausible to the Applicant who has not grasped this concept.

'C' is correct. In this situation, the only means of controlling pressure is by controlling drywell temperature. This is done by using the usual Drywell Cooling and Drywell Chilled Water Systems. When the normal cooling supply to the drywell chillers is lost (PSW), operators must align SSW to the chillers as a backup. Operators use Section 3.29 of the Loss of PSW ONEP (05-1-02-V-11) to accomplish this.

'D' is wrong. This subsystem is used as a means to <u>raise</u> drywell pressure to reduce drywell hydrogen concentration during a LOCA. Plausible to the Applicant who confuses this Drywell Purge subsystem of the Combustible Gas Control System with the "drywell purge" mode of operating the Containment Cooling System.

Technical References: 05-1-02-V-11, Loss of PSW ONEP 04-1-01-M41-1, Containment Cooling System			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-ONEP, Objective 2.0			
Question Source:	Bank # (Held in NRC Exam Room computer; question appeared on the approved LOT-309 NRC Exam)	X	
(note changes; attach parent)	Modified Bank #		
	New		
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295034 Secondary Containment Ventilation High Radiation / 9 Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION: EA2.01 Ventilation radiation levels	Tier #	1
	Group #	2
	K/A #	295034 EA2.01
	Rating	3.8
	Rev / Date	1 / 11-14-2012

Question 13

A spent fuel handling accident has occurred within the spent fuel pool.

As a result:

- Fuel Handling Area Ventilation Exhaust radiation levels have risen to 3.0 mR/hr and stabilized there
- Fuel Pool Sweep Ventilation Exhaust radiation levels have risen to 35 mR/hr and stabilized there

Area Radiation levels have <u>not</u> yet begun to rise.

How should the operators interpret and mitigate these radiation levels with respect to EP-4, Auxiliary Building Control, actions?

A. EP-4 entry is <u>not</u> yet required.

B. EP-4 entry is required, after which operators should verify automatic actions have occurred and monitor the area radiation levels listed on Table 10 of the EP.

C. EP-4 entry is required, after which operators should immediately place the Reactor Mode Switch to SHUTDOWN.

D. EP-4 entry is required, and operators should monitor for either <u>one</u> of these two exhaust radiation levels reaching its max safe value before taking further EP-4 action.

Answer: B

Explanation:

The Fuel Pool Sweep Vent Exhaust rad level of 35 mR/hr is above the EP-4 entry condition of 30 mR/hr (shown on Table 10 of the EP). Therefore, an EP-4 entry <u>is</u> required. However, once the EP has been entered, there is no specific EP-4 action yet required related to these vent exhaust rad levels. This is because Table 10 does not acknowledge “max safe” values for either of these two exhaust rad level conditions. Additionally, EP-4 has been entered solely because of a spent fuel handling accident (i.e., a situation of a unisolable primary system discharging outside the primary containment does not exist). The only “action” for operators to do at this point is to monitor the Table 10 <u>area</u> rad monitors for a rising trend.

'A' is wrong. As described above, an EP-4 entry is required.

'B' is correct for the reasons already described above.

'C' is wrong. See EP-4 steps 6, 8, and 9. The only way to get into EP-2 and placing the Mode Switch to Shutdown from EP-4 is by way of not being able to isolate an RPV connected system from discharging outside primary CTMT. As already described, no such situation exists.

'D' is wrong. As already described, there are no "max safe" values associated with the vent exhaust radiation levels.

Plausibility of the 3 distracters should speak for itself.

Technical References:

EP-4, Auxiliary Building Control flowchart

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-EP4, Objective 3

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295003 Partial or Complete Loss of AC / 6 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: AA2.04 System lineups	Tier #	1
	Group #	1
	K/A #	295003 AA2.04
	Rating	3.5
	Rev / Date	0 / 11-14-2012

Question 14

The plant is operating at rated power.

Service Transformer 11 trips on Sudden Pressure.

Which of the following electrical buses are required to be manually reenergized?

A. 12HE and 13AD

B. 11HD and 14AE

C. 12HE, 13AD, and 15AA

D. 11HD, 14AE, 16AB and 17AC

Answer: A

Explanation:

A loss of ST-11 will cause 12HE, 13AD and 15AA to de-energize, however, 15AA will reenergize from its Emergency DG. 12HE and 13AD will required to be manually reenergized.

'A' is correct from the explanation above.

'B' is wrong but plausible due to these buses are supplied by ST-21

'C' is wrong for the reason that 'A' is correct.

'D' is wrong but plausible for the same reason as 'B"

Technical References:

E-0001, Main One Line Diagram (electrical distribution)
04-S-01-R21-11, BOP Bus 11HD, System SOI, specifically the Precautions/Limitations and Section 3.2.
04-S-01-R21-12, BOP Bus 12HE, System SOI, specifically the Precautions/Limitations and Section 3.2.

04-S-01-R21-13, BOP Bus 13AD, System SOI, specifically the Precautions/Limitations and Section 3.2. 04-S-01-R21-14, BOP Bus 14AE, System SOI, specifically the Precautions/Limitations and Section 3.2. 04-S-01-R21-15, BOP Bus 15AA, System SOI, specifically the Precautions/Limitations and Section 3.3. 04-S-01-R21-16, BOP Bus 16AB, System SOI, specifically the Precautions/Limitations and Section 3.3. 04-S-01-R21-17, BOP Bus 17AC, System SOI, specifically the Precautions/Limitations and Section 3.3.			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-R2700, Objectives 10, 15.1 GLP-OPS-R2100, Objectives 4, 26.1			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4	Tier #	1
	Group #	1
Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: AA1.01 Recirculation System,	K/A #	295001 AA1.01
	Rating	3.5
	Rev / Date	0 / 10-12-2012

Question 15

Both Reactor Recirc Pumps are operating in slow speed.

- The ram's head for Jet Pumps 3 and 4 is completely ejected.
- TOTAL JP FLO recorder indication stabilizes at 40 Mlbm/hr.
- Jet Pump 3 indicates 1.25 Mlbm/hr flow.
- Jet Pump 4 indicates 1.0 Mlbm/hr flow.

How should actual Total Core Flow be determined?

A. Use TOTAL JP FLO recorder indication, as is.

B. Add 2.25 Mlbm/hr to TOTAL JP FLO recorder indication.

C. Subtract 2.25 Mlbm/hr from TOTAL JP FLO recorder indication.

D. Subtract 4.5 Mlbm/hr from TOTAL JP FLO recorder indication.

Answer: D

Explanation:

Flow through JP's 3 and 4 would be in the reverse direction under the given conditions. Since the flow summing circuit is errantly adding this reverse flow, the operator must subtract it twice from the total (TOTAL JP FLO recorder indication). Total reverse flow = 1.25 + 1.0 = 2.25. Actual core flow, therefore, = Total -2.25-2.25. Thus the correct answer here is to subtract 4.5 Mlbm/hr from the indicated TOTAL JP FLO. This method is prescribed by the NOTE of Step3.5 of ONEP 05-1-02-III-6 (JP Anomalies). This is the one and only method, regardless of where indicated TOTAL JP FLO stabilizes after the ram's head ejection (be it above or below 38 Mlbm/hr…see the Recirc System SOI, 04-1-01-B33-1, Section 3.17). The SOI Section 3.17 is applicable only for a reduction in recirc flow resulting from a single recirc pump trip.

Thus answer choice 'A' is wrong…it doesn't apply for this question, but is plausible for the same reasons.

'B' is wrong for the reasons described above; it's plausible to the Applicant who cannot remember the ONEP method described.

‘C’ is wrong for the reasons described above; it’s plausible to the Applicant who vaguely remembers the ONEP methodology, but who forgets that the ejected JP pump flow total must be subtracted twice. ‘D’ is correct for the reasons described above.			
Technical References: 04-1-01-B33-1, Recirc System SOI 05-1-02-III-6, Jet Pump Anomalies ONEP			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-ONEP, Objective 2.0			
Question Source:	Bank # GGNS-OPS-08791c	X	
(note changes; attach parent)	Modified Bank #		
	New		
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295006 SCRAM / 1 Knowledge of the operational implications of the following concepts as they apply to SCRAM : AK1.01 Decay heat generation and removal	Tier #	1
	Group #	1
	K/A #	295006 AK1.01
	Rating	3.7
	Rev / Date	1 / 11-14-2012

Question 16

The plant is operating at rated power when a complete NSSSS isolation occurs (cause unknown).

The NSSSS isolation cannot be reset.

After entering EP-2 (RPV Control), operators have stabilized the plant near 935 psig Reactor pressure.

It is now desired to cooldown the plant to MODE 4.

Per the Plant Shutdown IOI (03-1-01-3), what is the preferred method to be used for performing this cooldown?

A. Turbine Bypass Valves with the Manual Bypass Jack.

B. Turbine Bypass Valves with manually adjusting the IPC setpoint.

C. Manually cycling SRVs.

D. RCIC in CST-to-CST mode.

Answer: C

Explanation:

See IOI-3, Section 6.7. This is the applicable IOI method because with the NSSSS isolation, the MSIVs are closed, making the main condenser unavailable. Step 6.7.1 directs operators to depressurize the plant by manually cycling SRVs.

‘C’ is correct for the reason described above.

‘A’ and ‘B’ are wrong because there is no access to the main condenser with the MSIVs still closed and the NSSSS isolation still in effect. Both choices are plausible to the Applicant who fails to associate the NSSSS isolation with the fact that the main condenser is not available.

‘D’ is wrong for the reason ‘C’ is correct. Per IOI-3, step 6.7.4, RCIC may be placed in service in CST-to-CST mode for additional pressure/cooldown control, but only after having

begun the cooldown with the SRVs in step 6.7.1…therefore, RCIC is not the "preferred" method. Plausibility speaks for itself.

NOTE – Categorized as Higher Cognitive because of the need for the Applicants to recognize the unavailability of the main condenser due to the NSSSS isolation, allowing them to eliminate choices 'A' and 'B'.

Technical References:

03-1-01-3, Plant Shutdown IOI

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-IOI03, Objective 4.2

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(8) & (10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295016 Control Room Abandonment / 7 Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT: AA2.02 Reactor water level	Tier #	1
	Group #	1
	K/A #	295016 AA2.02
	Rating	4.2
	Rev / Date	1 / 11-14-2012

Question 17

Use your provided references to answer this question.

Due to a fire operators have abandoned the control room and have manned the Remote Shutdown Panels.

- Reactor pressure indicates 700 psig.
- Wide Range reactor water level indicates +50”.

What is actual reactor water level?

A. +47.5”

B. +45”

C. +40”

D. +32.5”

Answer: C

Explanation:

Applicants will be provided with Attachment II (Wide Range Level vs. Actual Level) found in the Remote Shutdown Panel ONEP (05-1-02-II-1).

‘A’ is wrong. This is the Actual Level (with Wide Range Level at +50”) derived from inappropriately interpolating Attachment II for a 900 psig reactor pressure. Plausibility is premised on the Applicant applying attention-to-detail.

‘B’ is wrong. This is the Actual Level (with Wide Range Level at +50”) derived from inappropriately using 800 psig reactor pressure on Attachment II. Plausibility is premised on the Applicant applying attention-to-detail.

‘C’ is correct. Applying Attachment II, with reactor pressure at 700 psig, we derive an Actual Level of +40”.

‘D’ is wrong. This is the Actual Level (with Wide Range Level at +50”) derived from

inappropriately interpolating Attachment II for a 500 psig reactor pressure. Plausibility is premised on the Applicant applying attention-to-detail.			
Technical References: 05-1-02-II-1, Remote Shutdown ONEP, Attachments I and II			
References to be provided to applicants during exam: Attachments I and II from Remote Shutdown ONEP (05-1-02-II-1)			
Learning Objective: GLP-OPS-ONEP, Objective 2.0			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295024 High Drywell Pressure / 5 Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: EK1.01 Drywell integrity	Tier #	1
	Group #	1
	K/A #	295024 EK1.01
	Rating	4.1
	Rev / Date	0 / 10-12-2012

Question 18

Which of the following is a potential consequence of exceeding an internal drywell pressure of 30 psig during a LOCA?

A. A loss of the pressure suppression function of Primary Containment

B. Inability to vent the Primary Containment using the 20" valves

C. Failure of Primary Containment due to exceeding the Primary Containment maximum external-to-internal d/p limit

D. Re-pressurization of the RPV from decay heat due to the inability of SRVs to remain open

Answer: A

Explanation:

'A' is correct. Exceeding 30 psig drywell internal pressure can result in a loss of drywell integrity, allowing the LOCA blowdown to bypass the horizontal vents and hence the suppression pool (which otherwise provides the pressure suppression function); i.e., drywell discharges would be directly to the Primary Containment air atmosphere.

'B' is wrong. While the 6" vent valves are no longer available with drywell pressure above 1.23 psig, the 20" vent valves are always available (see EP-1 (05-S-01-EP-1), Attachment 13).

'C' is wrong. The Primary Containment maximum external-to-internal d/p limit of 3 psid is anything but challenged when the drywell breaches due to high internal pressure. The drywell breach having bypassed the suppression pool will raise Primary Containment internal pressure, rather than lower it. Plausible to the Applicant who has not grasped the relationships between drywell versus Primary Containment internal pressure.

'D' is wrong. The SRVs have no limitation on the maximum drywell pressure against which they are able to remain open. Plausible to the weak Applicant, generally.

Technical References:

UFSAR, Section 6.2, Containment Systems

EP-1 (05-S-01-EP-1), Attachment 13, Containment Venting			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-M4101, Objectives 4, 5			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(8) & (9)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
700000 Generator Voltage and Electric Grid Disturbances / 6 Ability to operate and/or monitor the following as | they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: AA1.01 Grid frequency and voltage	Tier #	1
	Group #	1
	K/A #	700000 AA1.01
	Rating	3.6
	Rev / Date	0 / 10-12-2012

Question 19

The plant is operating at rated power.

The main generator is carrying 0 MVAR when there is a sustained 10KV spike in Grid voltage.

In order to maintain the main generator loading at 0 MVAR the operator must…

A. depress the TVR LOWER pushbutton.

B. depress the TVR RAISE pushbutton.

C. depress the LOAD DEMAND RAISE pushbutton.

D. depress the LOAD DEMAND LOWER pushbutton.

Answer: B

Explanation:

When the generator is paralleled to the grid, generator and grid voltage is a function of grid voltage (this is why 04-1-01-N40-1, Main Generator and Auxiliaries, does not provide a means to change generator voltage synched to the grid. It only provides means for VAR adjustment). Using Figure 2 of 03-1-01-2, Power Operations, VARs are depend on generator excitation. Over excitation yields + VAR output and Under excitation yields – VAR output. When the generator is tied to the grid, the grid voltage and generator voltage is matched (that is, generator no load voltage is equal to grid voltage). Once the generator is tied to the grid, VAR adjustments are made by adjusting the TVR voltage regulator to over or under excite the generator (as referenced to grid voltage). Likewise, when grid voltage changes this alters the reference point for over/under excitation of the generator and thus generator VAR output will change based on the new level of generator excitation. As grid voltage goes up this would be the equivalent of lowering the TVR voltage regulator. Therefore, in order to maintain generator VAR output as ZERO the operator must RAISE the TVR setting.

‘C’ and ‘D’ are wrong because they suggest that Load Demand be adjusted. This will change the generator MW output and is not procedurally called for to change VAR output. However, a student who has not mastered grid/generator operations may incorrectly try to adjust reactive load using the Load Demand setter which is used to adjust real load.

‘A’ is wrong. See explanation above.

‘B’ is correct. See explanation above.			
Technical References: 03-1-01-1, Cold Shutdown to Generator Carrying Minimum Load 03-1-01-2, Power Operations 04-1-01-N40-1, Main Generator and Auxiliaries			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-N4151, Objective 7			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(5) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295013 High Suppression Pool Temp. / 5 2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	Tier #	1
	Group #	2
	K/A #	295013 2.4.4
	Rating	4.5
	Rev / Date	0 / 10-12-2012

Question 20

The plant is operating at rated power with the following:

- RCIC is operating for its normal quarterly pump surveillance
- RHR 'A' is operating in Suppression Pool Cooling to support the RCIC pump run

If for some reason the RCIC pump run is prolonged and suppression pool temperature continues to rise, at what temperature will operators have to enter EP-3, Containment Control?

A. 95°F

B. 105°F

C. 110°F

D. 120°F

Answer: A

Explanation:

EP-3 entry for SP Temperature is at 95°F.

For this reason, only choice 'A' is correct.

'B' is wrong for the reason 'A' is correct. It is plausible because this is the Supp Pool Temperature LCO 3.6.2.1, when operating at >1% RTP and adding heat to the pool for testing.

'C' is wrong for the reason 'A' is correct. It is plausible because this is the Supp Pool Temperature LCO requiring an immediate manual scram.

'D' is wrong for the reason 'A' is correct. It is plausible because this is the Supp Pool temperature LCO that requires depressurizing the plant to < 200 psig.

Technical References:

EP-3, Containment Control Tech Spec LCO 3.6.2.1, Suppression Pool Average Temperature			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS- EP3, Objective 5			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295022 Loss of CRD Pumps / 1 Ability to operate and/or monitor the following as they apply to LOSS OF CRD PUMPS: AA1.02 RPS	Tier #	1
	Group #	2
	K/A #	295022 AA1.02
	Rating	3.6
	Rev / Date	1 / 11-14-2012

Question 21

The plant is operating at rated power with CRD Pump'B' tagged out for repairs.

- At time = 1400, CRD Pump 'A' trips (reason unknown).
- Operations and Electrical Maintenance are attempting to restore a pump.
- At time = 1405, Accumulators are declared inoperable for seven withdrawn control rods.

Per the CRD Malfunctions ONEP, which of the following describes the **MINIMUM** condition that would <u>require</u> operators to <u>immediately</u> place the Mode Switch in SHUTDOWN?

With charging water header pressure still below 1520 psig…

A. it is now time = 1420

B. it is now time = 1420 <u>AND</u> two additional accumulators have now been declared inoperable for a withdrawn control rod.

C. it is now time = 1425.

D. it is now time = 1425 <u>AND</u> two additional accumulators have now been declared inoperable for a withdrawn control rod.

Answer: C

Explanation:

See the CRD Malfunctions ONEP, Section 3.1 (for CRD Pump Trip). Time to restore charging water header pressure is 20 minutes <u>after</u> 2 accumulators have been declared inop. After the 20 minutes, if at least one accumulator is for a withdrawn rod is inop then place the RPS Mode Switch in SHUTDOWN.

For the reason described above, only choice 'C' is correct.

'A' is wrong. It suggests that the 20 minute clock starts at the time that charging water header pressure is lost. It does not; the clock starts once at least 2 CRD accumulators are declared

inop, which didn't happen until time = 1405. Plausibility speaks for itself.

'B' is wrong. Not only does it suggest the clock started at time = 1400, but it also suggest that the RPS Mode Switch need not be placed in SHUTDOWN unless two additional accumulators are declared inop (making a total of 9 inop accumulators). Plausibility is similar to choice 'A', with the added "distraction" of now having 9 inop accumulators…alluding to Tech Spec LCO 3.1.6 (Control Rod Pattern), Action B.2 which directs us to place the RPS Mode Switch in SHUTDOWN within 1 hour of having 9 or or more control rods out of pattern.

'D' is wrong. It suggests that the clock didn't start until 1405 (which is correct), but is wrong for the same reason that 'B' is wrong. Plausible for the same reason as 'B'.

Technical References:

05-1-02-IV-1, CRD Malfunctions ONEP

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-ONEP, Objective 2

Question Source:	Bank # GGNS-OPS-09471	X
(note changes; attach parent)	Modified Bank #	
	New	
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295035 Secondary Containment High Differential Pressure / 5 Knowledge of the reasons for the following responses as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: EK3.02 Secondary containment ventilation response	**Tier #**	1
	Group #	2
	K/A #	295035 EK3.02
	Rating	3.3
	Rev / Date	0 / 10-12-2012

Question 22

Auxiliary Building Ventilation (T41) and Fuel Handling Area Ventilation (T42) are in service when, per design, the Fuel Handling Area Ventilation Pressure Control Damper T42-F021 partially throttles closed (from its previous position).

What has this change in F021's position done within the secondary containment ventilation system, and what condition caused this F021 response?

A. Less outside air flow is being supplied to the T42 supply fans.
It re-positioned because the secondary containment d/p became less negative.

B. Less secondary containment air flow is being supplied to the T42 exhaust fans.
It re-positioned because the secondary containment d/p became less negative.

C. Less outside air flow is being supplied to the T42 supply fans.
It re-positioned because the secondary containment d/p became more negative.

D. Less secondary containment air flow is being supplied to the T42 exhaust fans.
It re-positioned because the secondary containment d/p became more negative.

Answer: A

Explanation:

See simplified Figure 1 from training material GFIG-OPS-T4200 (or P&ID M-1104A). Pressure Control Damper F021 is on the inlet side of the T42 supply fans. When it throttles in the closed direction less outside air flow is being supplied to the T42 supply fans. There is no such damper associated with the T42 exhaust fans. Therefore the condition now is that the T42 exhaust fans are still exhausting Fuel Handling Area air to the outside at the same capacity as before the F021 position change. Thus, with less outside air coming in and the same inside air going out, the result is that the d/p becomes greater (i.e., more negative). F021 responded to a condition where, for whatever reason, its controller sensed a d/p that had become less negative.

For the reasons described above, only 'A' is correct.

'B', 'C' 'D' are wrong for the reason 'A' is correct. At GGNS these distracters have been proven to readily discriminate for one or both of two reasons: 1) many examinees cannot

recall where the F021 damper is located in the T42 system (supply versus exhaust); 2) many examinees struggle with the concept of “more negative” versus “less negative” d/p. Therefore, these choices are plausible.			
Technical References: GFIG-OPS-T4200, T42 System Figures P&ID M-1104A, Fuel Handling Area Ventilation System			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-T4200, Objectives 4, 8			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(4) & (5)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
203000 RHR/LPCI: Injection Mode Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI: INJECTION MODE: K6.10 Component cooling water systems	Tier #	2
	Group #	1
	K/A #	203000 K6.10
	Rating	3.0
	Rev / Date	0 / 10-12-2012

Question 23

A LOCA is in progress.

Only RHR Pump ‘C’ is available.

It is operating in LPCI mode to maintain reactor water level when SSW Pump ‘B’ trips and cannot be re-started.

Consider the following:

1. LPCI loop ‘C’ injection water temperature
2. RHR Pump ‘C’ seal temperature
3. RHR Pump ‘C’ Room temperature

Which of the above will be adversely impacted by the loss of SSW ‘B’?

A. 1 and 2. only

B. 1 and 3, only

C. 2 and 3, only

D. 1, 2, and 3

Answer: C

Explanation:

See SSW P&IDs M-1061B and D. Unlike RHR loops ‘A’ and ‘B’, (which have heat exchangers cooled by the respective SSW subsystem) RHR loop ‘C’ has no heat exchanger. Therefore LPCI loop ‘C’ injection water temperature is unaffected by a loss of SSW ‘B’. However, both the RHR Pump ‘C’ seal cooler and the RHR Pump ‘C’ Room cooler is supplied by SSW ‘B’.

For these reasons, only ‘C’ is correct.

‘A’, ‘B’ ‘D’ are wrong because they each suggest that RHR ‘C’ has a heat exchanger. Plausible to the Applicant who cannot recall that it doesn’t.

Technical References: P&IDs M-1061B and D, SSW System			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-E1200, Objective 13.3			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
205000 Shutdown Cooling 2.2.12 Knowledge of surveillance procedures.	Tier #	2
	Group #	1
	K/A #	205000 2.2.12
	Rating	3.7
	Rev / Date	1 / 11-14-2012

Question 24

The plant is in MODE 5 with RHR 'A' operating in Shutdown Cooling.

E12-F009 RHR SHUTDN CLG INBD SUCT VLV is required to be stroked timed by surveillance procedure 06-OP-1E12-C-0012, "RHR A Shutdown Cooling Mode Valve Test."

Which of the following will be the shutdown cooling flowpath?

A. RHR 'B' suction through E12-F008, RHR SHUTDN CLG OTBD SUCT VLV.

B. ADHR suction through E12-F066B, FPC ASSIST TO RHR PMP B

C. ADHR suction through G41-F348, Spent Fuel Pool to RHR

D. RHR 'C' suction through E12-F066C, Fuel Pool Cooling & Cleanup to C Loop.

Answer: C

Explanation:

When stroking the E12-F009 per this surveillance Shutdown cooling is lost from the common suction header. The only suction source would be for ADHR from the Spent Fuel Pool.

'C' is correct for the reason above.

'A' is wrong for the reason 'C' is correct. Even if the F008 is open, the F009 is in series with the F008.

'B' is wrong for the reason 'C' is correct. This would be the normal suction for ADHR using the common suction header.

'D' is wrong for the reason 'C' is correct. RHR 'C' does not have the ability to align for Shutdown Cooling.

Technical References:

04-1-01-E12-2 section 4.9
P&ID drawings M1085A & B

References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-E1201, Objective 9.4			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
209001 LPCS Knowledge of the effect that a loss or malfunction of the following will have on the LOW PRESSURE CORE SPRAY SYSTEM: K6.05 ECCS room cooler(s)	Tier #	2
	Group #	1
	K/A #	209001 K6.05
	Rating	2.8
	Rev / Date	1 / 11-14-2012

Question 25

The LPCS Pump Quarterly Functional Test is in progress with the plant at rated power.

- The LPCS Room Cooler SSW inlet flange ruptures.
- Several minutes later the P680-8A1-A4, LPCS RM SMP LVL HI-HI annunciator is locked in.
- Both LPCS sump pumps are in AUTO and the Mode Switch is in ALTERNATE.

As a result…

A. (1) The operating crew will enter EP-4 due to exceeding 1 Max Safe value of Table 10.
(2) Only one LPCS sump pump is operating.

B. (1) The operating crew will enter EP-4 due to exceeding an Operating Limit of Table 10.
(2) Only one LPCS sump pump is operating.

C. (1) The operating crew will enter EP-4 due to exceeding 1 Max Safe value of Table 10.
(2) Both LPCS sump pumps are operating.

D. (1) The operating crew will enter EP-4 due to exceeding an Operating Limit of Table 10.
(2) Both LPCS sump pumps are operating.

Answer: D

Explanation:

With a rupture of the SSW supply to the room cooler water will be introduced into the LPCS pump room. The inflow will drain into the floor drain sumps and cause the Hi-Hi level alarm which is an entry condition for EP-4 exceeding the operating limit (see EP-4 Table 10). Part 2 of the question asked how many sump pumps are currently running, with both handswitches in AUTO, both pumps should be running, a Hi-Hi level will cause the auto start of the Standby pump.

For these reasons, ‘D’ is correct and ‘A’, ‘B’, ‘C’ are wrong (but each is plausible to the Applicant who believes a Max safe has been exceeded or the wrong number of sump pumps running).

Technical References:

E1271-021 & 022 & 33 EP-4, Secondary Containment Control Table 10			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-E2100, Objective 11.1			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(7) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
209002 HPCS Knowledge of the effect that a loss or malfunction of the HIGH PRESSURE CORE SPRAY SYSTEM (HPCS) will have on following: K3.03 Adequate core cooling	Tier #	2
	Group #	1
	K/A #	209002 K3.03
	Rating	3.9
	Rev / Date	0 / 10-12-2012

Question 26

Which of the following indicates that adequate core cooling has been **LOST**?

A. RPV level at -200" on compensated fuel zone, with no injection

B. RPV level at -211" on compensated fuel zone, with HPCS injecting at 6500 gpm

C. RPV level at -155" on wide range, with only CRD injecting maximized for flow

D. RPV level at -189" on compensated fuel zone, with only CRD injecting maximized for flow.

Answer: B

Explanation:

See lesson plan GLP-EP-EPTS26, page 8. Also see EP Technical Bases (02-S-01-40), Attachment II, pages 1 and 2. Adequate core cooling exists whenever any of the following conditions exist: 1) level is at or above TAF (-167"; i.e., core submergence); 2) level is at or above -191 (Minimum Steam Cooling RPV Water Level); 3) level is at or above 204" without injection; 4) RPV pressure is at or above the Minimum Steam Cooling Pressure (EP-2A, ATWS RPV Control, Table 6 identifies this pressure value dependent upon the number of open SRVs).

'A' is wrong. This choice suggests that we've entered the Steam Cooling leg of EP-2 (RPV Control) (see EP-2, step L-10 for the transition to Steam Cooling). Steam Cooling provides adequate core cooling down to -204", without injection, once level is below TAF (see EP Tech Bases, Attachment IV, page 22 for the Steam Cooling explanation). Plausibility speaks for itself.

'B' is correct. This choice suggests that we're at the bottom of the Alternate Level Control leg of EP-2 (step L-14) and considering the Spray Cooling requirements, with injection. There we find that even though we are still above -217", our HPCS Pump has malfunctioned in a way that it is only able to inject at 6500 gpm…this is less than the requirement that it be injecting above 7000 gpm. Therefore, adequate core cooling has been LOST. See EP Tech Bases, Attachment IV, page 24 for an explanation of the Spray Cooling requirements for ensuring adequate core cooling.

'C' is wrong. This choice has us well above TAF, which means we have core submergence.

Plausibility speaks for itself.

'D' is wrong. This choice clearly shows that we've lost core submergence (are below -167" TAF), but we still have injection and are still above the -191" Minimum Steam Cooling RPV Water Level. See EP Tech Bases, Attachment IV, page 24 for an explanation of how this condition provides adequate core cooling. Plausibility speaks for itself.

Technical References:

02-S-01-40, EP Technical Bases, Attachment II, page 1 of 4 (definition of Adequate Core Cooling).

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-MCD05, Objective 4

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(7) & (10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
212000 RPS Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM: K5.02 Specific logic arrangements	Tier #	2
	Group #	1
	K/A #	212000 K5.02
	Rating	3.3
	Rev / Date	0 / 10-12-2012

Question 27

The plant is operating at 20% power when the following MSIVs go closed:

- B21-F022B, MSL B Inboard
- B21-F028B, MSL B Outboard
- B21-F022D, MSL D Outboard

Without operator action, how will plant operation be impacted?

A. Plant remains operating at 20% power; there is <u>no</u> RPS actuation.

B. Plant remains operating at 20% power; there is a half-scram on RPS ‘A’.

C. Plant remains operating at 20% power; there is a half-scram on RPS ‘B’.

D. Plant automatically scrams (full scram).

Answer: A

Explanation:

See GFIG-OPS-C7100, Figure 9 logic arrangement (or controlled drawings E-1173-015, 016, 017 and 018). With closure of MSL B (in the stem conditions), a closure of MSL C is needed to cause a half-scram on RPS ‘A’, while a closure of MSL A would cause a half-scram on RPS ‘B’…neither of these conditions occur in the stem conditions. With closure of MSL D (in the stem conditions), a closure of MSL A is needed to cause a half-scram on RPS ‘A’, while a closure of MSL C would cause a half-scram on RPS ‘B’…neither of these conditions occur in the stem conditions. Without there being a closure of three MSLs (only two are closed in the stem), there can be no full scram from MSIV closures. Clearly, the RPS coincident logic is not satisfied to cause any RPS actuation. Placing the plant at only 20% power in the stem conditions assures that there can be no indirect RPS actuation due to high reactor pressure (i.e., with two MSLs still open, there is plenty of room to pass 20% steam flow and prevent a high reactor pressure automatic scram from occurring).

For the above reasons, only choice ‘A’ is correct and ‘B’, ’C’, ‘D’ are wrong. Their plausibility is based on the Applicant having to recall this logic arrangement.

Technical References: RPS Channel logic drawing E-1173, sheets 015, 016, 017, and 018			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-C7100, Objective 10			
Question Source:	Bank # GGNS-OPS-05114	X	
(note changes; attach parent)	Modified Bank #		
	New		
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(5)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
215004 Source Range Monitor Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.03 Stuck detector	**Tier #**	2
	Group #	1
	K/A #	215004 A2.03
	Rating	3.0
	Rev / Date	0 / 10-12-2012

Question 28

A mid-cycle reactor startup is in progress with the reactor having just gone critical.

- Operators have verified SRM/IRM overlap
- Operators are continuing to withdraw control rods
- SRMs are being withdrawn as necessary to maintain SRM count rate between 10^2 and 10^5 cps.

The SRM 'E' detector becomes stuck (will not move).

Which of the following describes how SRM 'E' will respond if rod withdrawals continue, <u>and</u> describes how operators will mitigate the consequences of SRM 'E''s response in order to continue the reactor startup?

If rod withdrawals continue and SRM 'E' spikes up to 2 x 10^5 cps, it will…

A. generate a rod block <u>and</u> an RPS 'A' half scram. Operators will have to manually bypass SRM 'E' then reset the half scram.

B. generate a rod block <u>and</u> an RPS 'B' half scram. Operators will have to manually bypass SRM 'E' then reset the half scram.

C. generate an RPS 'A' half-scram, only. Operators will have to manually bypass SRM 'E' then reset the half scram.

D. generate a rod block, only. Operators will have to manually bypass SRM 'E'.

Answer: D

Explanation:

Thus being a "mid-cycle" reactor startup assures that all RPS shorting links are installed; therefore, no SRM that reaches 2 x 10^5 cps (i.e., SRM scram setpoint) can actuate RPS in any way. However, spiking to 2 x 10^5 cps means that SRM 'E' did reach the rod block setpoint of 1 x 10^5 cps. A rod block now exists. In order to continue the reactor startup, operators will have to manually bypass SRM 'E' with its joystick at P601.

For the reasons above, 'D' is correct and 'A', 'B', 'C' are wrong (but plausible to the

Applicant who cannot recall the specific setpoints and/or recognize that all shorting links are installed (allowing for <u>no</u> RPS actuation of any type) during this mid-cycle startup.			
Technical References: 04-1-01-C51-1, Neutron Monitoring SOI 04-1-02-1H13-P680-4A2-C5, alarm response instruction for CONTROL ROD WITHDRAWAL BLOCK 04-1-02-1H13-P680-7A-A2, alarm response instruction for REACTOR SCRAM TRIP RPS drawing E-1173, sheets 015 thru 018			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-C5101, Objectives 8.2, 18			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(5) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
217000 RCIC Ability to manually operate and/or monitor in the control room: A4.06 Suppression pool level	Tier #	2
	Group #	1
	K/A #	217000 A4.06
	Rating	3.6
	Rev / Date	0 / 10-12-2012

Question 29

Which of the following valid annunciators will prevent RCIC from continuously adding water from the CST to the Suppression Pool?

A. P870-5A-D4, CST LVL HI-LO

B. P601-21A-B5, CST LVL LO

C. P870-4A-C3, SUPP POOL LVL HI-LO

D. P601-21A-A3, RCIC PMP DISCH FLO LO

Answer: B

Explanation:
Only the P601-21A-B5, CST level low and P601-21A-C5, Supp Pool level high annunciators result in a suction source swap from the CST to the Suppression Pool. The operator may manually switch the valves back to CST suction; however, the suction valves will automatically swap back as long as one of these two conditions exists. Therefore, answer 'B' is correct. For the same reason answers 'A' and 'C' are incorrect but plausible since the both suggest a condition that will cause the RCIC suction swap to Suppression Pool.

Answer 'D' is incorrect because this will cause the E51-F019 min flow valve to open. As it happens, this valve discharges to the suppression pool. Plausibility rests in the fact that an applicant may assume this annunciator indicates that RCIC pump is not functioning properly.

Technical References:

04-1-02-1H13-P870-5A-D4 alarm response instruction
04-1-02-1H13-P870-4A-C3 alarm response instruction
04-1-02-1H13-P601-21A-B5 alarm response instruction
04-1-02-1H13-P601-21A-A3 alarm response instruction

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-E5100, Objective 8.1

Question Source:	Bank #	

(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
263000 DC Electrical Distribution Knowledge of electrical power supplies to the following: K2.01 Major D.C. loads	Tier #	2
	Group #	1
	K/A #	263000 K2.01
	Rating	3.1
	Rev / Date	1 / 11-14-2012

Question 30

The plant is operating at rated conditions.

The following alarms are received:

- P680-9A-D11, GEN SEAL OIL TROUBLE
- P680-10A-C10, GEN H2 SEAL OIL PUMP C FAULT

Which of the following is the DC Electrical bus that was lost?

A. 11DF

B. 11DD

C. 11DE

D. 11DB

Answer: A

Explanation:

See 04-1-01-1-L11 Attachment 1F shows the power supply for the DC SEAL OIL PUMP C MOTOR.

‘A’ is correct for the reason above.

‘B’ is wrong but plausible because it is a BOP DC Bus and 11DD combined with 11DE create 11DF.

‘C’ is wrong because for same reason as ‘B’

‘D’ is wrong (but equally plausible because it is a ESF DC Bus, if the student believes that due to the pump being an emergency pump would be supplied from an ESF source.

Technical References:

04-1-01-L11-1, Attachment 1F, 125V DC BUS 11DF LOAD LIST			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-l1100, Objectives, 6.2, 8.3			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
201001 CRD Hydraulic Knowledge of the physical connections and/or cause-effect relationships between CONTROL ROD DRIVE HYDRAULIC SYSTEM and the following: K1.09 Plant air systems	Tier #	2
	Group #	2
	K/A #	201001 K1.09
	Rating	3.1
	Rev / Date	0 / 10-12-2012

Question 31

The plant is operating at rated power when the instrument air supply to the in-service CRD Flow Control Valve controller is lost (broken tubing).

What is the response of CRD cooling water header flow rate indication at P601?

A. Immediately drops to approximately 0 gpm.

B. Initially remains at the normal flow rate indication but eventually drops to approximately 5 gpm.

C. Immediately rises to full upscale (approximately 70 gpm).

D. Initially remains at the normal flow rate indication but eventually rises to full upscale (approximately 70 gpm).

Answer: B

Explanation:

See P&ID M-1081B (CRD Hydraulic System). The Flow Control Valves (FCVs) use piston-type actuators. Upon loss of the air supply, the actuator initially doesn't change position (thus, cooling water header flow rate initially remains at its normal indication). However, due to internal air leaks inherent in these actuators, the FCV eventually drifts closed to its minimum position (a mechanical stop), <u>not</u> fully closed, which ensures that approximately 5 gpm continues through the cooling water header to cool the CRD Mechs.

For these reasons, only 'B' is correct.

'A' is wrong for the reason 'B' is correct. Plausible to the Applicant who both forgets that these are piston-type actuators (not diaphragm-type) and/or forgets about the mechanical stop.

'C' is wrong for the reason 'B' is correct. Plausible to the Applicant who both forgets that these are piston-type actuators (not diaphragm-type) and forgets that the actuator leaks in way that drifts the valve closed, not open.

'D' is wrong for the reason 'B' is correct. Plausible to the Applicant that the actuator leaks in way that drifts the valve closed, not open.

Technical References: P&ID M-1081B, CRD Hydraulic System Lesson plan GLP-OPS-C111A (CRD Hydraulic System), page 28.			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-C111A, Objective 11.2			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(6)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
201005 RCIS Knowledge of ROD CONTROL AND INFORMATION SYSTEM (RCIS) design feature(s) and/or interlocks which provide for the following: K4.06 Rod pattern controller rod blocks	Tier #	2
	Group #	2
	K/A #	201005 K4.06
	Rating	3.5
	Rev / Date	0 / 10-12-2012

Question 32

Reactor power is 15%.

Control Rod 12-17 CD was moved from position 12 to position 48.

What is the response of the control rod if the INSERT pushbutton is depressed and held depressed?

The control rod will…

A. insert only one notch.

B. continuously insert until limited by the RWL.

C. continuously insert until limited by the RPC.

D. continuously insert until position 00 is reached.

Answer: C

Explanation:

The Rod Pattern Controller (RPC) controls both insert and withdraw commands at power levels at or below the Low Power Setpoint (LPSP) of 26% power (see TR3.3.2.1-1 for setpoint of 26% ±2). Above the LPSP, the Rod Withdrawal Limiter (RWL) is in control for rod withdrawal commands. The RPC ensures that rod movements conform to the programmed rod movement sequence, which is divided up into "groups" of rods that have programmed upper position and lower position limits within the sequence.

'A' is wrong. This choice suggests that the lower position limit for that group is position 46 (i.e., moved only one notch). No such limit exists in the programmed rod movement sequence. Plausibility speaks for itself.

'B' is wrong for two reasons: 1) at 15% power (below the LPSP), the RWL is not controlling, and 2) the RWL limits withdrawals not insertions. Plausibility speaks for itself.

'C' is correct for the reasons already described.

'D' is wrong. This choice suggests that the programmed sequence has groups positioned at 48 with a lower limit of position 00 (full-in); no such sequences exist. Plausibility speaks for itself.			
Technical References: 04-1-01-C11-2, RC&IS SOI TR3.3.2.1			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-C1102, Objective 8.1			
Question Source:	Bank # GGNS-OPS-00389a	X	
(note changes; attach parent)	Modified Bank #		
	New		
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
259002 Reactor Water Level Control Ability to predict and/or monitor changes in parameters associated with operating the REACTOR WATER LEVEL CONTROL SYSTEM controls including: A1.03 Reactor power	Tier #	2
	Group #	1
	K/A #	259002 A1.03
	Rating	3.8
	Rev / Date	0 / 10-12-2012

Question 33

A power ascension is in progress per IOI-2, "Power Operations".

Currently:

- Reactor power is steady at 40%
- Reactor water level is steady at +36" on the Feedwater Master Level Controller
- RFPT 'A' is operating
- RFPT 'B' is in 'Standby' per the SOI

A Feedwater Master Level Controller malfunction causes reactor water level to suddenly lower to +26" and stabilize there.

Power and pressure have stabilized after this transient.

Which of the following describes the stabilized reactor power response to this malfunction, and why?

A. Reactor power is still 40% because the Recirc Pumps are in SLOW speed.

B. Reactor power is still 40% because although only one RFP is operating, the other RFP has already been RESET.

C. Reactor power is lower because both Recirc FCVs have run back to their MIN ED positions.

D. Reactor power is lower because both Recirc FCVs have run back to approximately 15% to 20% open.

Answer: B

Explanation:

Per IOI-2, Section 5.11, both Reactor Recirc Pumps are up-shifted to FAST speed when power is between 26% and 28%; therefore with the stem condition of 40%, choice 'A' is wrong (but plausible unless the Applicant recalls the power level at which we up-shift

pumps).

Per IOI-2, Section 5.17, it's not until power is ~50% but no higher than 65%, that we place the second feed pump (RFP) in operation. However, the RFP that will be placed into operation was already placed in its "Standby" status per the Feedwater System SOI, Section 4.5.2 or 4.5.3. A review of Section 4.5.3 (for RFP 'B' as an example), step 4.5.3a(12) shows that the RFP trip has already been RESET. So long as both RFPs are either operating or have been RESET the Recirc Pump FCV Runback logic will not initiate a FCV runback when reactor water level goes below Level 4 (~32.7"). Thus, choice 'B' is correct; the current position of both Recirc FCVs will not change…causing reactor power to remain the same.

'C' is wrong for the reason 'B' is correct. It is plausible to the Applicant who cannot recall how we ascend in power (per IOI-2) and, therefore, believes a FCV runback (to MIN ED positions of ~25% open) will occur.

'D' is wrong for the reason 'B' is correct. It is plausible to the Applicant who cannot recall how we ascend in power (per IOI-2) and, therefore, believes a FCV runback will occur. See alarm response instruction 04-1-02-1H13-P680-3A-D1, where we see that an actual FCV runback (if it were to occur) runs the FCVs all the down to between 15% and 20% open…below their MIN ED positions.

Technical References:

04-1-01-N21-1, Feedwater System SOI
Alarm Response Instruction 04-1-02-1H13-P680-3A-D1
03-1-01-2, Power Operations IOI
E-1163-042, Recirc System FCV Interlock & Reset circuits schematic
E-1154-007, Feedwater System RFPT 'A' Trip and Alarms schematic
E-1154-014, Feedwater System RFPT 'A' Trip Solenoid Valve SV-F612A schematic

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-B3300, Objective 24

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(5) & (10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
263000 DC Electrical Distribution G2.2.22 Knowledge of limiting conditions for operations and safety limits.	Tier #	2
	Group #	1
	K/A #	263000 G2.2.22
	Rating	4.0
	Rev / Date	1 / 11-14-2012

Question 34

Which of the following would require entry into Tech Spec 3.8.1, AC Sources - Operting?

A. Division 2 Diesel Generator trips during surveillance.

B. Service Transformer 21 is tagged out for maintenance.

C. Incoming Feeder Breaker 152-1514, BUS 15AA FDR FRM XFMR ESF 11 trips on faulty overcurrent device.

D. Port Gibson 115kv line is deenergized from the local substation.

Answer: A

Explanation:

'A' is correct per LCO 3.8.1, All three Emergency Diesel are required to be operable.

'B', 'C' and 'D' is wrong per LCO 3.8.1, only Two qualified circuits between offsite transmission and the onsite class 1E.

Technical References:

Tech Spec LCO 3.8.1, AC Sources – Operating

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-L1100, Objective 13

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	

10CFR Part 55 Content:	55.41(b)(8) & (10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
300000 Instrument Air Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: K5.01 Air compressors	Tier #	2
	Group #	1
	K/A #	300000 K5.01
	Rating	2.5
	Rev / Date	0 / 10-12-2012

Question 35

Following a scram from rated power, the following conditions exist simultaneously:

- LOCA
- ST-11 lockout (transformer internal fault)

Which Plant Air Compressor(s) will automatically start?

A. 'B' only

B. 'B' and 'C' only

C. 'C' only

D. None

Answer: D

Explanation:

The LOCA shed locks out PAC 'A', so it's not considered in the answer choices (would be a poor distracter). LOCA also interlocks away SSW 'B' from being able to supply any PAC cooling. The ST-11 lockout loses buses 12HE (including MCC 22B31) and 13AD. MCC 22B31 supplies the control power needed to run PAC 'B', so PAC 'B' is not available. 13AD powers the compressor motor for PAC 'C', so it's not available. The 13AD loss also takes away power panel 13P22, which will fail closed valve P43-F289 (TBCW Return From PACs)…leaving the PACs with no cooling at all. Therefore, there are NO Plant Air Compressors available.

For the reasons above, only choice 'D' is correct.

'A', 'B', 'C' are wrong for the reasons 'D' is correct. They are all plausible because they require, from the Applicant, a well-grounded comprehension of both the impact of the LOCA and the electrical distribution system.

Technical References:

04-1-01-P51-1, Plant Air System SOI			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-P5100, Objective 42			
Question Source:	Bank # GGNS-OPS-08969	X	
(note changes; attach parent)	Modified Bank #		
	New		
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(4) & (5) & (7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
202001 Recirculation Ability to (a) predict the impacts of the following on the RECIRCULATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.08 Recirculation flow mismatch	**Tier #**	2
	Group #	2
	K/A #	202001 A2.08
	Rating	3.1
	Rev / Date	1 / 11-14-2012

Question 36

The plant is operating at rated power with the positions of Recirc FCVs 'A' and 'B' matched.

A flow controller malfunction causes FCV 'B' to partially close then stop.

After the transient, there is a steady 7% mismatch between the flows in the 'A' and 'B' Recirc loops.

How has this transient impacted the Recirc System, <u>and</u> what operator action is **<u>required</u>** to mitigate this impact?

A. Tech Spec LCO 3.4.1, Recirculation Loops – Operating, is entered.

   Immediately trip one Recirculation pump.

B. The TOTAL JP FLOW indication at P680 may be reading HIGHER than actual Total Core Flow.

   Repair the controller and re-match loop flows by raising the 'B' loop flow.

C. The TOTAL JP FLOW indication at P680 may be reading LOWER than actual Total Core Flow.

   Lower the 'A' loop flow to match the 'B' loop flow.

D. Tech Spec LCO 3.4.1, Recirculation Loops – Operating, is entered.

   Either shutdown one recirc loop <u>or</u> repair the controller and re-match loop flows by raising the 'B' loop flow, <u>or</u> re-match loop flows by lowering the 'A' loop flow.

Answer: D			
Explanation:			

The Applicant begins by recalling Tech Spec Surveillance SR 3.4.1.1. There we find that the loop flow mismatch is 5% if operating at or above 70% total core flow, and 10% if operating below 70% total core flow. Next, the Applicant has to recognize (from the stem conditions) that with the post-transient mismatch of 7%, we're still operating well above 70% total core flow…therefore, the 5% mismatch limit applies. Once the Applicant determines this, he recognizes that the Recirc System is inoperable per LCO 3.4.1…suggested in Part 'A' of answer choices 'A' and 'D'. Once we enter LCO 3.4.1, Action A.1 gives a maximum of 2 hours to re-match the loop flow; otherwise, we must enter Single-Loop Operations. In order differentiate choice 'A' from choice 'D', the Applicant must realize that we are not **"required"** to re-match loops flows by raising 'B' loop flow to match 'A' loop flow. In fact, if this were to actually occur, we would simply lower the 'A' loop flow to match the 'B' loop flow, allowing us to quickly exit LCO 3.4.1.

For these reasons, only choice 'D' is correct.

'A' is wrong for the reasons 'D' is correct. The "analysis" (described above) required of the Applicant speaks to its plausibility.

'B' is wrong for sake of its Part 'B' that again suggests that 'B' loop flow must be raised to match 'A' loop flow. Part 'A' is not only plausible, but is also a true statement. When the LCO SR 3.4.1.1 mismatch limits are exceeded, the loop with the higher flow can possibly cause a reverse flow condition through the jet pumps in the loop with the lower loop flow. If this were to occur, the TOTAL JP FLOW indication at P680 (which indicates the sum of all 24 jet pump flows…i.e., provides total core flow indication) would be reading HIGHER than actual total core flow…this is because that summer simply sums all 24 d/p's across the jet pumps, regardless of which way water is actually flowing through the pump (forward or reverse).

'C' is wrong for sake of both Parts 'A' and 'B'. See the above discussions. Plausibility speaks for itself.

NOTE – this item qualifies as a question suitable for the RO exam (i.e., it is not an SRO-only item) because of two reasons: 1) the jet pump reverse flow discussion is found not only in the LCO Bases, but is also clearly found in the Recirc System lesson plan (GLP-OPS-B3300); therefore, the item is not requiring the RO Applicant to recall Tech Spec Bases information; and 2) Part 'B' for choices 'A' and 'D' already expose the 2-hour Action of LCO 3.4.1, Condition A; i.e., the item is not requiring the RO Applicant to recall Tech Spec Actions that are greater than 1 hour.

Technical References:

Tech Spec LCO 3.4.1, Recirculation System – Operating

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-B3300, Objective 48

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X

Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(5) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
239001 Main and Reheat Steam Knowledge of electrical power supplies to the following: K2.01 Main steam isolation valve solenoids	Tier #	2
	Group #	2
	K/A #	239001 K2.01
	Rating	3.2
	Rev / Date	1 / 11-14-2012

Question 37

The plant is operating at rated power.

Which of the following will cause the MSIV Div 1 solenoids to de-energize?

A. Loss of 16B42

B. Loss of 15B42

C. Loss of 13B22

D. Loss of 14B22

Answer: C

Explanation:

See electrical drawing E-1174. The 'A' solenoids for the MSIVs 120 VAC type, and are powered From RPS Bus 'A' via that bus's circuit breakers CB5A and CB7A. RPS is normally powered by the MG set which is powered by 480vac MCC 13B22

For this reason, only choice 'C' is correct.

'A' is wrong for the reason 'C' is correct. It is plausible to the Applicant who does recall the normal power supply for RPS, this is the alternate power supply for 'B' RPS

'B' is wrong for the reason 'C' is correct. It is plausible to the Applicant who does recall the normal power supply for RPS, this is the alternate power supply for 'B' RPS

'D' is wrong for the reason 'C' is correct. It is plausible to the Applicant who does recall the normal power supply for RPS, this is the normal power supply to the 'A' RPS MG.

Technical References:

E-1174, C71 RPS MG Set Control System schematic
04-1-01-C71-1, attachment III page 1 of 3

References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-B1300, Objective 11.1			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
262002 UPS (AC/DC) Knowledge of the effect that a loss or malfunction of the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) will have on following: K3.02 Recirculation pump speed	Tier #	2
	Group #	1
	K/A #	262002 K3.02
	Rating	2.9
	Rev / Date	0 / 10-12-2012

Question 38

The plant is operating at rated power with power panel 12P12 (backup power to RFPT INFI-90) tagged out for repairs.

A complete loss of 120 VAC output from inverter __(1)__ will cause a __(2)__.

A. (1) 1Y87
   (2) downshift of one Reactor Recirc Pump

B. (1)1Y87
   (2) downshift of both Reactor Recirc Pumps

C. (1) 1Y99
   (2) downshift of one Reactor Recirc Pump

D. (1) 1Y99
   (2) downshift of both Reactor Recirc Pumps

Answer: D

Explanation:

1Y99 is the primary (normal) source of power to the Digital Feed Control System (DFCS) INFI-90 control panel 1HP612. And once powered, P612 has its own internal power supplies, including the power supply for Narrow Range Level transmitter trip units C34-N004A, B, & C. This means that a total loss of power to the P612 panel de-energizes the instrument loops for all three of these trip units…causing them to fail downscale. [Note – Unique to P612 is a third source of power to it from BOP power panel 12P12; i.e., unless 12P12 is out of service (indicated in the stem conditions), a total of power from 1Y99 would not de-energize the INFI-90 P612 panel.] No matter which of the three level trip units (A, B, or C) has been selected for C34 level control, both Reactor Recirc Pumps will receive an automatic downshift signal (from P612) as the trip unit fails low (i.e., simulating a level of +11.4”, which is the pump downshift setpoint). Therefore ‘D’ is correct.

‘A’ and ‘B’ are wrong. The 1Y87 inverter is one of the 4 ESF-related inverters and has no connection with the DFCS P612 panel. These choices are plausible because the 1Y87 inverter does power the instrument loop for one Narrow Range Level trip unit…but these 4 (total) Narrow Range trip units are system B21 components (B21-N080A, B, C, D). They have no interface with the DFCS INFI-90 panel P612.

‘C’ is wrong because it suggests that only one of the two recirc pumps will auto-downshift. Plausibility speaks for itself.
Technical References: E-1173-28, RPS Testability schematic (shows the B21 NR level trip unit instrument loops) E-1030-005, 208-120 VAC BOP Power Panel 12P12 (one-line that shows the 12P12 breaker that feeds the INFI-90 P612 panel) E-0035, Reactor Feedwater Distributed Control Cabinet Power Supplies (shows both sources of power into the INFI-90 Control panel P612; i.e., the 1Y99 inverter source and the backup source from power panel 12P12) 04-1-01-N21-1, Feedwater System SOI, Attachment III, page 8 of 8 (shows the 12P12 power panel breaker lineup to P612) E-1168-004, C34 Feedwater Control System Instrument Loops (shows how the P612 panel internal power supplies power the C34 NR level instruments (C34-R606A, B, C)…these are the same loops that power the C34 NR level trip units (N004A, B, C)
References to be provided to applicants during exam: None
Learning Objective: GLP-OPS-C3400, Objective 3.8.1

Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
239003 MSIV Leakage Control Ability to manually operate and/or monitor in the control room: A4.03 Main steamline pressures	Tier #	2
	Group #	2
	K/A #	239003 A4.03
	Rating	3.3
	Rev / Date	1 / 11-14-2012

Question 39

During a LOCA an operator is attempting to initiate the Inboard MSIV Leakage Control System (E32) using the E32 SOI.

Before placing the SYSTEM INITIATION handswitches to OPERATE, the operator is required to check that the INBD MSIV LCS PERMISSIVE annunciator is in alarm and sealed-in.

- The annunciator is <u>not</u> in alarm.
- The operator suspects the reason is that MSL pressures are too high.

The INBD MSIV LCS PERMISSIVE annunciator alarms at __(1)__ . The operator can locate/monitor the MSL pressure for MSIV Leakage Control on __(2)__.

A. (1) 20 psig
   (2) P601

B. (1) 20 psig
   (2) P655

C. (1) 60 psig
   (2) P601

D. (1) 60 psig
   (2) P655

Answer: B

Explanation:

The MSL pressure PISs are located at control room back panel P655 (see E-1210-021, MSIV LCS Instrument Loop schematic). The PIS setpoint is <20 psig (see alarm response instruction 04-1-02-1H13-P601-17A-D6).

For these reasons, only choice ‘B’ is correct.

‘A’ is wrong is suggests that the PISs are at panel P601. This is plausible for two reasons: 1) the annunciator mentioned in the stem conditions is at P601, and 2) the controls for MSIVs themselves are located at P601.

‘C’ is wrong for the reason ‘B’ is correct. The P601 part is plausible for the same reason described for choice ‘A’. The 60 psig part is plausible because this is the pressure at which the RCIC will isolate

‘D’ is wrong because its second part suggests the setpoint is 60 psig. Plausible for the same reason as choice ‘C’.

Technical References:

E-1210-021, MSIV LCS Instrument Loop schematic
Alarm Response Instruction 04-1-02-1H13-P601-17A-D6 (INBD MSIV LCS PERMISSIVE)

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-E3200, Objective 7.1

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
2.1.2 Knowledge of operator responsibilities during all modes of plant operation.	Tier #	3
	Group #	
	K/A #	2.1.2
	Rating	4.1
	Rev / Date	1 / 11-14-2012

Question 40

The plant is in MODE 2.

A feedwater level control malfunction occurs and causes a reactor power rise to 20% and remains constant.

Per GGNS and/or Fleet procedures…

A. the Shift Manager should now direct operators to take the Mode Switch to RUN.

B. any on-shift SRO should direct an immediate power reduction.

C. the ACRO should immediately reduce power using the pull sheet.

D. the ACRO should immediately insert a manual scram.

Answer: D

Explanation:

MODE 2 requires that the Mode Switch be in the STARTUP position. In that position, the APRM high neutron flux automatic scram setpoint is 18%. The only resolution to this plant condition is to correct the situation by placing the Mode Switch in SHUTDOWN…i.e., immediately insert a manual scram. Per EN-OP-115 (Conduct of Operations), section 5.2[1], the RO is required to take this action on his own without the need for SRO direction.

For these reasons, choice ‘D’ is correct and ‘A’, ‘B’, ‘C’ are wrong (but plausible for reasons described above).

Technical References:

EN-OP-115, Conduct of Operations

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-PROC, Objective 1.3

Question Source:	Bank # (Held in NRC Exam Room computer)	X
(note changes; attach parent)	Modified Bank #	
	New	
Question History:	Last NRC Exam	**YES (2011)**
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management.	Tier #	3
	Group #	
	K/A #	2.1.37
	Rating	4.3
	Rev / Date	0 / 10-12-2012

Question 41

The ACRO is about to perform a reactivity manipulation.

Per the Operations Philosophy procedure, which of the following **requires** a Reactivity Management SRO for direct oversight with no concurrent duties?

A. In preparation for a control rod sequence exchange, a planned lowering of power from 100% to 78% using recirc, within a duration of 5 hours.

B. While operating at rated power, inserting each fully withdrawn control one notch then back to position 48 to satisfy the Tech Spec Surveillance Requirement.

C. Raising power from 96% (has been at 96% for several days) to 100% using recirc, within a duration of 15 minutes.

D. In preparation for main turbine testing, lowering power from 100% to 85% using recirc, within a duration of 4 hours.

Answer: A

Explanation:

See Operations Philosophy procedure (02-S-01-27), Section 6.8.

'A' is correct. Per Section 6.8.1.a(3) this is a Type 3 Reactivity Change. Per Section 6.8.1.b(1)(3rd bullet), a Type 3 requires the Reactivity Management SRO with no concurrent duties.

'B' is wrong. Per Section 6.8.1.a(1) this is a Type 1 Reactivity Change requiring only CRS oversight. Plausibility speaks for itself.

'C' is wrong. Per Section 6.8.1.a(1) this is a Type 1 Reactivity Change requiring only CRS oversight. Plausibility speaks for itself.

'D' is wrong. Per Section 6.8.1a(2)(1st bullet) this is a Type 2 Reactivity Change, again where a dedicated Reactivity Management SRO is not required.

NOTE – This is not an SRO-only question because the RO is equally responsible to ensure that he does not perform any power maneuvers without first being aware of the level of oversight that he

needs.			
Technical References: 02-S-01-27, Operations Philosophy			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-PROC, Objective 4.0			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
Knowledge of limiting conditions for operations and safety limits.	Tier #	3
	Group #	
	K/A #	G2.2.22
	Rating	4.0
	Rev / Date	1 / 11-14-2012

Question 42

Which of the following **VIOLATES** a Tech Spec Safety Limit (SL)?

A. Following a Group 1 (MSIV) isolation from rated power, the post-scram analysis reveals that reactor steam dome pressure peaked high at 1275 psig.

B. Two Recirc Pumps are running in slow speed at MIN ED with reactor power at 30%.

C. After a single control rod drift from rated power, core flow has just been reduced to 70 Mlbm/hr; the STA recognizes that MCPR is now reading 1.10 on CYCLOPS.

D. Following a complete loss of feedwater from rated power, reactor water level drops to a low of -151" before turning and being recovered to its normal band.

Answer: C

Explanation:

'A' is wrong. SL 2.1.2 limit for steam dome pressure is 1325 psig.

'B' is wrong. SL 2.1.1.1 is still being met. In fact, this situation suggests operators are ready to upshift pumps to fast.

'C' is correct. SL 2.1.1.2 is being violated for two-loop MCPR…must be at least 1.11.

'D' is wrong. SL 2.1.1.3 for water level is above TAF (-167").

NOTE – Categorized as Higher Cognitive because to derive 'C' as the correct answer the Applicant must recognize that the choice 'C' plant conditions requires that we still be in Two-Loop versus Single-Loop operations (i.e., impossible to have been operating at rated power, before the core flow reduction, in Single-Loop).

Technical References:

Tech Spec Safety Limits, Section 2.1

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-TS001, Objective 28			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
Ability to obtain and interpret station electrical and mechanical drawings.	Tier #	3
	Group #	
	K/A #	G2.2.41
	Rating	3.8
	Rev / Date	1 / 11-14-2012

Question 43

Use your provided references to answer this question.

Consider the control schematic for TBCW Pump 'A'.

One of the 35 amp control power fuses is burned out.

How is electrical control of the pump impacted by this fuse failure?

A. Can electrically start and stop the pump at the breaker, but not from the control room.

B. Cannot electrically start the pump from any location, but all electrical stopping and automatic tripping are still functional.

C. Can electrically stop the pump at the breaker or from the control room, but automatic tripping is disabled.

D. Cannot electrically stop the pump from any location, and automatic tripping is disabled.

Answer: D

Explanation:

Refer to electrical drawing E-1227-001. The two 35 amp fuses power all electrical tripping…local manual stopping, remote manual (control room) stopping, and protective tripping. Thus, having either one of these two fuses blown interrupts continuity of power to all of that.

For this reason, only choice 'D' is correct.

'A', 'B', 'C' are wrong for the reason 'D' is correct. They are all plausible to the Applicant who has not become proficient at being able to read/understand the control scheme print for a typical 4.16 KV breaker.

NOTE – Concerning the KA match for this item. We've chosen the control drawing for a TBCW pump only because it represents the typical control scheme for 4.16 KV pumps, generically. For this reason, we have chosen not to swap the original KA; i.e., this Exam Author feels that this item as presented meets the intent of ES-401, Section D.2.a (1st paragraph) concerning "plant-wide".

Technical References: E-1227-001, TBCW Pump ‘A’ electrical control			
References to be provided to applicants during exam: E-1227-001, TBCW Pump ‘A’ electrical control			
Learning Objective: GLP-OPS-R2700, Objective 26			
Question Source:	Bank # GGNS-OPS-09093a	X	
(note changes; attach parent)	Modified Bank #		
	New		
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
Ability to comply with radiation work permit requirements during normal or abnormal conditions.	Tier #	3
	Group #	
	K/A #	G2.3.7
	Rating	3.5
	Rev / Date	0 / 10-12-2012

Question 44

Per EN-RP-105, Radiological Work Permits (RWP), a radiation worker must participate in an RWP Pre-Job Brief prior to entering…

A. the RHR 'C' Pump Room.

B. the Aux Building Steam Tunnel.

C. the LPCS Pump Room.

D. the El. 119' Piping Penetration Room.

Answer: B

Explanation:

See EN-RP-105, section 5.3[8], 4th bullet…VHRA or LHRA entry requires the RWP Pre-Job Brief. Of the 4 areas among the answer choices, only the Aux Bldg Steam Tunnel (choice 'B') is a Locked HRA. The other 3 areas are only Radiation Areas, for which the RWPs require no pre-job briefs.

Technical References:

EN-RP-105, Radiological Work Permits

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-PROC, Objective 50.3

Question Source:	Bank # (Held in NRC Exam Room computer)	X
(note changes; attach parent)	Modified Bank #	
	New	
Question History:	Last NRC Exam	**YES (2010 NRC Exam)**
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	

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

Examination Outline Cross-Reference	Level	RO
Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	Tier #	3
	Group #	
	K/A #	G2.3.14
	Rating	3.4
	Rev / Date	0 / 10-12-2012

Question 45

A refueling outage is in progress.

- HFTS fuel assembly transfers are in progress.
- The Fuel Handling Platform has an irradiated fuel assembly on the grapple in the normal (full up) up position.
- The Fuel Handling Platform mast is jammed (cannot lower the fuel assembly).
- The Spent Fuel Pool level begins to lower.

What is the immediate concern for this condition?

A. High General Area Radiation

B. High Airborne Radiation

C. High Loose Contamination

D. High Fixed Contamination

Answer: A

Explanation:

The High Radiation During Fuel Handing ONEP (05-1-02-II-8) step 3.1.4 directs the Shift Manager to evacuate affected area if at any time he believes any spent fuel assembly may become uncovered. This is because spent fuel is highly radioactive and when uncovered will raise general area radiation such that exposure limits will be exceeded quickly. This makes only answer ‘A’ correct.

‘B’ is plausible based on the fact that irradiated fuel assemblies contain radioactive gasses that if released would present an airborne radiation concern.

‘C’ and ‘D’ are plausible based on the same principle as ‘B’. Fission product gasses decay to particulates and would become a contamination concern (loose on general surfaces and fixed when in areas that cannot be decontaminated).

Technical References:

05-1-02-II-8 High Radiation During Fuel Handing ONEP		
References to be provided to applicants during exam: None		
Learning Objective: GLP-OPS-ONEP Objective 2		
Question Source:	Bank # (Held in NRC Exam Room computer)	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(12)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295018 Partial or Total Loss of CCW / 8	Tier #	1
Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : AK3.01 Isolation of non-essential heat loads	Group #	1
	K/A #	295018 AK3.01
	Rating	2.9
	Rev / Date	0 / 10-12-2012

Question 46

Ten days after RF18, the plant is operating at rated power.

- One of the two running CCW pumps trips
- The Standby pump will not start.

With only one CCW pump running, operators enter the Loss of CCW ONEP for a "partial loss".

Per that ONEP, what is the **FIRST** system to which CCW is manually isolated, and what is the reason for that system being isolated?

A. RWCU, to maximize the available CCW cooling to the Reactor Recirc Pumps.

B. RWCU, to protect the RWCU filter demins from high temperatures.

C. FPCC, to maximize the available CCW cooling to the Reactor Recirc Pumps.

D. FPCC, to transition the FPCC heat exchangers over to SSW cooling as quickly as possible.

Answer: A

Explanation:

'A' is correct. Refer the ONEP Subsequent Actions for a partial loss, specifically step 3.2. Maximizing cooling to the Recirc pump bearings will prevent an unnecessary plant transient (scram). Also, since it is less than 4 months after a refueling outage FPCC is not isolated. For this reason, choice 'A' is correct.

'B' is wrong. Although the ONEP mentions RWCU filter demin temperature of 130F, it is not the reason for taking RWCU out of service. RWCU has its own protective function to isolate the filter demins for high temperature.

'C' is wrong because FPCC is not intentionally isolated < 4 months after a refueling outage per step 3.2.2. This is plausible because a student would need to remember this fact. The student may mistakenly assume that it's OK because SSW is available for FPCC cooling.

‘D’ is wrong because FPCC is not intentionally isolated < 4 months after a refueling outage per step 3.2.2 This is plausible for the same reason as answer ‘c’.			
Technical References: 05-1-02-V-1, Loss of CCW ONEP			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-ONEP, Objective 2			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295025 High Reactor Pressure / 3 Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE: EK1.06 Pressure effects on reactor water level	Tier #	1
	Group #	1
	K/A #	295025 EK1.06
	Rating	3.5
	Rev / Date	0 / 10-12-2012

Question 47

A small break LOCA has been in progress for 10 minutes and operators are implementing EP-2, RPV Control.

- The ACRO is controlling reactor water level with the Condensate Booster Pumps (CDPs) in a band of -30" to +30" with the Startup Level Controller in AUTO.

- The Rover is controlling reactor pressure with SRVs in a band of 450 psig to 600 psig.

Each time the Rover has reason to **open** one or more SRVs, the ACRO should **initially** expect to see indicated reactor water level __(1)__ because _____(2)_____.

A. (1) drop
(2) the open SRV(s) is/are removing water inventory from the RPV

B. (1) drop
(2) the sudden pressure drop is producing more boiling in the core

C. (1) rise
(2) the sudden pressure drop is producing more boiling in the core

D. (1) remain constant
(2) the Startup Level Controller is able to maintain level at setpoint

Answer: C

Explanation:

The Rover will open/re-open one or more SRVs as reactor pressure nears the HIGH REACTOR PRESSURE end of his assigned band of 450-600 psig. Doing so causes a rapid pressure drop in the RPV, which is operating at saturated conditions (Psat / Tsat). The pressure drop immediately causes a greater amount of boiling to occur in the core, which presents greater resistance to the flow of water up through the fuel channels. This increased resistance against channel flow amounts to an increased back-pressure that translates over to the downcommer annulus (where indicated water level is sensed) causing that level to rise.

For these reasons, choice 'C' is correct and choice 'B' is wrong (but plausible to the Applicant has cannot recall, or who never well understood, the concept of "swell").

‘A’ is wrong for the reason ‘C’ is correct. Swell (along with the continuing injection flow) more than overcompensate for any inventory being removed from the RPV. A very plausible distracter to the Applicant who doesn’t even try to apply the “swell” concept to answering this question.

‘D’ is wrong for the reason ‘C’ is correct. Plausible, again, to the Applicant who has never grasped the concept of shrink and swell.

Technical References:

04-1-01-N21-1, Feedwater System SOI

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-C3400, Objective 23

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(5)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295019 Partial or Total Loss of Inst. Air / 8 Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and the following: AK2.01 CRD hydraulics	**Tier #**	1
	Group #	1
	K/A #	295019 AK2.01
	Rating	3.8
	Rev / Date	1 / 11-14-2012

Question 48

The plant is operating at rated power.

A singular failure results in losing electrical power **only** to the following valve:

- P53-F001, INSTRUMENT AIR SUPPLY HDR TO CTMT
- Power to the valve cannot be immediately restored.

Which of the following describes the immediate operational impact of this failure, and why?

A. Operators will have to insert a manual scram either in response to, or to preclude, multiple control rod drifts.

B. Operators will have to insert a manual scram in response to the MSIVs beginning to drift closed.

C. Plant may remain at rated power because this valve is an MOV; it will remain as is.

D. Plant may remain at rated power because this valve is a gagged open AOV; it will remain as is.

Answer: A

Explanation:

P53-F001 is a fully-functional (not gagged open), solenoid-operated AOV, normally-open, delivering Instrument Air to major CTMT systems: the Scram Air Header (part of the CRD Hydraulics System) and the MSIVs. Taking electrical power away from the solenoid fails the AOV closed. The operators will soon afterwards experience multiple control rod drifts as Scram Air Header pressure bleeds off, forcing them to insert a manual scram per the requirements of the CRD Malfunctions ONEP (05-1-02-IV-1), Immediate Operator Action 2.3.1.

‘A’ is correct for the reasons already discussed.

‘B’ is wrong. Although the MSIVs will eventually begin to drift closed, this won’t happen until long after the operators will have had to respond to the rod drifts; it will not have been the reason (i.e., the “why”) for inserting a manual scram. This choice’s plausibility speaks for itself.

‘C’ is wrong. As stated, this valve is a fail-closed on loss of power AOV, not one of the CTMT isolation MOVs that would otherwise remain as is. This choice’s plausibility speaks for itself. ‘D’ is wrong. As stated, this valve is a fail-closed on loss of power AOV, <u>not</u> one of the several gagged-open Secondary CTMT isolation AOVs (for example: P53-F026A, Instrument Air Supply to Aux Bldg, which is upstream of the P53-F001 valve) that would remain as is on a loss of power. This choice’s plausibility speaks for itself.			
Technical References: 05-1-02-IV-1, CRD Malfunctions ONEP 05-1-02-III-5, Automatic Isolations ONEP (see section 3.10)			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS- P5100, Objective 42			
Question Source:	Bank # (Held in NRC Exam Room computer)	X	
(note changes; attach parent)	Modified Bank #		
	New		
Question History:	Last NRC Exam	**YES (2011)**	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295021 Loss of Shutdown Cooling / 4 Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING: AA1.05 Reactor recirculation	Tier #	1
	Group #	1
	K/A #	295021 AA1.05
	Rating	3.0
	Rev / Date	0 / 10-12-2012

Question 49

The plant is in MODE 4 with the following:

- RHR 'B' operating in Shutdown Cooling
- Both Reactor Recirc Pumps operating in SLOW speed
- One RWCU Pump operating

RHR Pump 'B' trips (motor thermal overload) and cannot be re-started.

Which of the following should operators use to monitor reactor coolant temperature?

A. RWCU Regenerative HX Inlet temperature

B. RWCU Non-Regenerative HX Inlet temperature

C. RHR 'B' HX Inlet temperature

D. Reactor Recirc Loop 'A' or 'B' Suction temperature

Answer: D

Explanation:

See RHR Shutdown Cooling (SDC) SOI (04-1-01-E12-2), P/L 3.8.16. Regardless of the status RHR SDC (operating or not), if a Reactor Recirc Pump is running the preferred method for monitoring reactor coolant temperature is use the Loop Suction Temperature computer point(s) on PDS.

For this reason, only choice 'D' is correct.

'A' is wrong for the reason 'D' is correct. Its plausibility comes from Section 4.2.2c(19)(c), on page 40, of the SOI.

'B' is wrong for the reason 'D' is correct. Plausible to the Applicant who recalls Section 4.2.2c(19)(c) but who cannot remember the HX arrangement in the RWCU flowpath.

'C' is wrong for the reason 'D' is correct. P/L 3.8.16.a directs us to use the RHR HX Inlet temperature <u>if</u> no Reactor Recirc Pump is running. Thus, its plausibility.

Technical References: 04-1-01-E12-2, Shutdown Cooling SOI			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-E1200, Objective 14.1			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295026 Suppression Pool High Water Temp. / 5 Knowledge of the reasons for the following responses as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: EK3.05 Reactor SCRAM	Tier #	1
	Group #	1
	K/A #	295026 EK3.05
	Rating	3.9
	Rev / Date	0 / 10-12-2012

Question 50

The Suppression Pool Temperature leg of EP-3 (Containment Control) directs us to insert a manual scram (by entry into EP-2) <u>before</u> pool temperature reaches 110 °F.

Per the EP Bases, what is one of the reasons for this operator action?

A. Ensures the Tech Spec REQUIRED ACTION to insert a scram at 110°F is satisfied.

B. Ensures the Tech Spec REQUIRED ACTION to emergency depressurize at 110°F is satisfied.

C. Ensures that the Primary Containment cannot be over-pressurized under any condition.

D. Ensures that Cold Shutdown Boron Weight can be injected before exceeding HCTL (should an ATWS occur).

Answer: A

Explanation:

'A' is correct. See EP Bases (02-S-01-40), Attachment VI, page 7 of 34, Discussion for Steps SPT-3 and SPT-4, 3rd bullet. Also see Tech Spec Required Action 3.6.2.1.D.1.

'B' is wrong. Its plausibility lies in the fact that there is a TS 3.6.2.1 Required Action (Action E.1) to de-pressurize the RPV if pool temperature goes above 120 °F.

'C' is wrong. Simply scramming at a pool temperature of 110 °F does not guarantee against PC over-pressurization. Plausible to the Applicant who cannot recall the TS Required Action, but who does recognize there is a relationship between the scram reducing the rate of energy production thus reducing the rate of heat input into the pool.

'D' is wrong. See the bottom of the page 7 mentioned above. The 110 °F value is also the Boron Injection Initiation Temperature (BIIT). See Attachment IX, page 24 of 25, 1st bullet. The relationship between the BIIT and not exceeding HCTL is based on the need to inject HOT Shutdown Boron Weight, not COLD.

Technical References:

EP Technical Bases (02-S-01-40) Tech Spec LCO 3.6.2.1, Suppression Pool Temperature			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-EP3, Objective 7			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
264000 EDGs Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS (DIESEL/JET) will have on following: K3.03 Major loads powered from electrical buses fed by the emergency generator(s)	**Tier #**	2
	Group #	1
	K/A #	264000 K3.03
	Rating	4.1
	Rev / Date	0 / 10-12-2012

Question 51

The plant is operating at rated power with the following:

- FPCC is operating with only the 'A' pump operating
- FPCC 'A' Filter/Demin is in service
- Div 1 DG is carrying Bus 15AA alone

- A spurious signal trips the Div 1 DG output breaker; that trip signal no longer exists.
- Operators have now "restored" the Aux Building.
- Operators have **not** performed any actions related to the FPCC system.

What is the status of the FPCC system 3 minutes after the DG output breaker trip?

A. One pump is running; the 'A' Filter/Demin is isolated.

B. No pump is running; the 'A' Filter/Demin is isolated.

C. One pump is running; the 'A' Filter/Demin is not isolated.

D. No pump is running; the 'A' Filter/Demin is not isolated.

Answer: B

Explanation:

See drawing E-1120-001 (Table 1 for the Load Shed and Sequencing of Div 1 components). The momentary trip signal to the Div 1 DG created a BUV "shed" of the 'A' FPCC pump. As soon as the trip signal no longer exists, the output re-closes and re-energizes the bus (another function of LSS). The pump trip causes an auto-isolation of the Filter/Demin on low flow after a 2-minute time delay. Refer again to E-1120-001. LSS does not automatically re-sequence the FPCC pump back onto the bus; the pump must be manually started.

For these reasons, only choice 'B' is correct.

'A', 'C', 'D' are wrong but plausible to the Applicant who cannot recall either the fact that the pump is not re-sequenced, or that the F/D auto-isolates on low flow.

Technical References: E-1120-001, LSS Table 1 for Div 1 FPCC System SOI (04-1-01-G41-1), page 14 (refers to the F/D low flow isolation)			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-G4146, Objectives 7.2, 7.5			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295031 Reactor Low Water Level / 2 Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: EA1.07 Safety/relief valves	Tier #	1
	Group #	1
	K/A #	295031 EA1.07
	Rating	3.7
	Rev / Date	0 / 10-12-2012

Question 52

The crew is operating in the Alternate Level Control leg of EP-2, RPV Control.

Reactor pressure is 600 psig when operators open 8 ADS Valves.

Where in the main control room can operators use RED lights to verify the 8 ADS Valves have actually opened and are discharging steam?

A. P601 vertical section, only

B. P601 apron above each SRV handswitch, only

C. P601 vertical section and backpanel P631

D. P601 apron above each SRV handswitch and backpanel P631

Answer: B

Explanation:

See ADS System lesson plan (GLP-OPS-E2202), pages 36-37.

'A' is wrong because those lights indicate only that the SRV 'B' solenoid is powered. See ADS electrical drawing E-1161-004, Figure 2 (which shows the 'B' DC bus power distribution to SRVs), and E-1161-012 (which shows the RED/GREEN lights for the SRVs at panel P631 and the vertical section of P601). Plausibility speaks for itself.

'B' is correct. These lights rely on there being at least 30 psig tailpipe pressure (pressure switch) indicating the SRV is open and passing steam. See drawing E-1161-013 (example valve B21-F041A. Follow the pressure switch contacts to energize K22A which feeds to Red and Green indicating lights on P601-19C section next to the key switches). ARI P601-19A-A5 shows the 30 psig setpoint.

'C' is wrong for the same reason 'A' is wrong (i.e., P631 RED lights shows only that the 'B' solenoids are energized for each SRV). Plausibility speaks for itself.

'D' is wrong because it includes P631. Plausibility speaks for itself.

Technical References: E-1161-004, ADS SRVs Schematic E-1161-012, ADS SRVs Schematic E-1161-013, ADS SRVs Schematic			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-E2202, Objective 18			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
600000 Plant Fire On Site / 8 G2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	Tier #	1
	Group #	1
	K/A #	600000 2.4.49
	Rating	4.6
	Rev / Date	0 / 10-12-2012

Question 53

A fire has started in Div 2 Diesel Generator Room.

The fire brigade is responding.

Per 10-S-03-2, Response To Fires, which of the following DG Room Outside Air Fans is/are required to be started?

A. Div 1, only

B. Div 3, only

C. Div 1 and Div 3, only

D. Div 2 and Div 3, only

Answer: C

Explanation:

See 10-S-03-2, section 6.2.3 (Control Room Operator Actions), specifically, step 6.2.3.g, which directs the operator to start the ventilation systems (understood to be the O/A fans) in the other rooms (in this case, Div 1 and Div 3 rooms).

For this reason, choice ‘C’ is correct and the other choices are wrong but plausible simply because they represent potential rooms for which the vent systems must be running unless the Applicant recalls the specific direction given in this procedure.

Technical References:

10-S-03-2, Response To Fires

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-PROC, Objective 58.4

Question Source:	Bank # (Held in NRC	X

	exam room computer)	
(note changes; attach parent)	Modified Bank #	
	New	
Question History:	Last NRC Exam	**YES (2011)**
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1 Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: EK2.07 Neutron monitoring system	Tier #	1
	Group #	1
	K/A #	295037 EK2.07
	Rating	4.0
	Rev / Date	0 / 10-12-2012

Question 54

Operators have just entered EP-2A, ATWS RPV Control.

The Power leg of that EP directs operators to immediately start both SLC pumps (rather than waiting for a Suppression Pool temperature rise) <u>if</u> indicated reactor power is greater than a certain value.

What is that specified value?

A. 3%

B. 4%

C. 5%

D. 6%

Answer: C

Explanation:

See Power leg steps Q-2, 3, and 4 of EP-2A. The specified value is 5%, making choice 'C' the only correct choice.

'B' is wrong and is the strongest distracter; this is the value that preceded the 5% value in our latest EP-2A.

'A' and 'D' are wrong; their plausibility is targeted towards the very weakest Applicant.

Technical References:

EP-2A, ATWS RPV Control

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-EP02A, Objective 3

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
215005 APRM / LPRM Knowledge of the physical connections and/or cause-effect relationships between AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM and the following: K1.09 Reactor recirculation system	Tier #	2
	Group #	1
	K/A #	215005 K1.09
	Rating	3.6
	Rev / Date	0 / 10-12-2012

Question 55

A total of ____ Recirc Loop Flow transmitters input to each APRM Channel for flow-biased scram and rod block setpoints.

A. 2

B. 4

C. 6

D. 8

Answer: A

Explanation:

See lesson plan GLP-OPS-B3300, page 72. The 'A' loop uses 4 FTs (N014A, B, C, D); the 'B' loop uses N024A, B, C, D…for a total of 8. Each APRM has 2 inputs, one from 'A" loop and one from 'B' loop. Only choice 'A' is correct.

'B', 'C' & 'D' are wrong for the reason 'D' is correct. For a simple recall item, each is as plausible as is the answer when considering there are 2 loops.

Technical References:

E1172-023
E1172-26
E1172-29
E1172-32

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-C5104, Objective 3.3

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No

Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
217000 RCIC Ability to monitor automatic operations of the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) including: A3.02 Turbine startup	Tier #	2
	Group #	1
	K/A #	217000 A3.02
	Rating	3.6
	Rev / Date	0 / 10-12-2012

Question 56

A DBA LOCA occurs from rated power.

Which of the following identifies proper RCIC operation?

A. (1) The RCIC Gland Seal Compressor will <u>not</u> start.
(2) RCIC will <u>not</u> isolate on Level 8.

B. (1) The RCIC Gland Seal Compressor will start.
(2) RCIC will isolate on Level 8.

C. (1) The RCIC Gland Seal Compressor will <u>not</u> start.
(2) RCIC will isolate on Level 8.

D. (1) The RCIC Gland Seal Compressor will start.
(2) RCIC will <u>not</u> isolate on Level 8.

Answer: C

Explanation:

E-1185-017 Gland Seal Compressor electrical print shows that relay E21-K103 will prevent the compressor from starting. This relay is found on E-1182-026 and is energized on a LPCS initiation (LOCA). Since Drywell pressure will rapidly reach 1.39psig, the Gland Seal Compressor will not start. Therefore 'C' is the only correct answer.
Only installing EP attachment 3 (Defeating all RCIC isolation and non-mechanical turbine trip interlocks) will prevent a Level 8 isolation. This is accomplished by removing the K93 relay (E-1185-034).

The plausibility for the Gland Seal Compressor starting is that it will normally start on initiation. The applicant must remember that isolations are not automatically bypassed for the RCIC system and therefore will still isolate on Level 8.

Technical References:

EP attachment 3
E-1185-017
E-1185-034
E-1182-026

References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-E5100, Objective 10			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
264000 EDGs Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.04 Consequences of operating under/over excited	Tier #	2
	Group #	1
	K/A #	264000 A2.04
	Rating	2.9
	Rev / Date	0 / 10-12-2012

Question 57

The CRO has just paralleled the Div 2 DG with the grid for its monthly surveillance run.

- The DG is carrying 350 KW
- The DG is carrying 2.5 MVARs rather than the required 0.25 MVARs.
- The DG has been operating this way (350 KW with 2.5 MVARs) for 10 minutes before the CRO recognizes his error.

What is the consequence of operating the DG in this manner, <u>and</u> what operator action is required once the CRO recognizes his error?

A. Generator Amps (1P75-R604B) are higher than expected
Reduce the MVARs to the required 0.25

B. Generator Amps (1P75-R604B) are higher than expected
Immediately trip the DG

C. Generator Amps (1P75-R604B) are lower than expected
Reduce the MVARs to the required 0.25

D. Generator Amps (1P75-R604B) are lower than expected
Immediately trip the DG

Answer: A			

Explanation:

As generator VARs depart from 0 (over or under excited) generator apparent power goes up (this is evident using a simple power triangle). Since power is a function of voltage and current, and voltage is determined by the grid; therefore, current must also go up. Per the surveillance (06-OP-1P75-M-0002) there is no need to trip the DG since it is still well within its operating limits; rather simply lower its MVARs to specified 0.25. For this reason, only choice ‘A’ is correct.

‘B’ is wrong because it suggests the need to trip the machine. Plausible to the Applicant who considers that the DG has been running that long at 10 times the specified amount of excitation.

‘C’, ‘D’ are wrong because they indicate a lower generator amp output…true only if the machine were running under-excited but above -0.25 MVAR; this is not the case. Plausible to the Applicant

who fails to comprehend the relationship between MVARs and Generator current.			
Technical References: 06-OP-1P75-M-0002, Standby Diesel Generator 12 Functional Test			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-P7500, Objective 29			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(5) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
400000 Component Cooling Water Ability to predict and / or monitor changes in parameters associated with operating the CCWS controls including: A1.03 CCW Pressure	Tier #	2
	Group #	1
	K/A #	400000 A1.03
	Rating	2.7
	Rev / Date	0 / 10-12-2012

Question 58

The plant is operating at rated power with CCW Pumps 'A' and 'C' operating and 'B' in Standby.

The Rover is preparing to rotate pumps to a configuration of 'A' and 'B' operating and 'C' in Standby, per the SOI.

Considering how this evolution is performed, how should the CCW Pumps Discharge Pressure indication at P870 respond?

A. Lower about 40 to 50 psig then return to the original indicated pressure.

B. Lower about 10 to 15 psig then return to the original indicated pressure.

C. Rise about 40 to 50 psig then return to the original indicated pressure.

D. Rise about 10 to 15 psig then return to the original indicated pressure.

Answer: D

Explanation:

See the CCW SOI (04-1-01-P42-1), Section 5.2, specifically steps 5.2.2.a thru d for how this evolution is performed. Refer to GLP-OPS-COM02, NRC Generic Fundamentals, Pumps (specifically pages 45-46) for a review of operating centrifugal pumps in parallel.

The Applicant must be able to determine from his fundamentals knowledge how the "operating point" (of the pump curve) will change when the 'B' pump is started in step 5.2.2.b…i.e., it shifts upward (experience at GGNS that it raises the operating point by about 12 psig) when we now have 3 pumps operating rather than two. When we stop the 'C' pump in step 5.2.2.d, the operating point goes back to the original 2-pump discharge pressure.

For these reasons, only choice 'D' is correct.

'A', 'B' are wrong because they suggest the operating point would lower when the 3rd pump is started. Plausible to the Applicant who has a weak recollection of these GFES principles.

'C' is wrong because it suggests a much higher shift upward of the operating point when the 3rd

pump is started. Plausible to the Applicant who cannot recall the pressure change from his simulator scenario and JPM training.			
Technical References: 04-1-01-P42-1, CCW System SOI GLP-OPS-COM02, NRC Generic Fundamentals, Pumps (specifically pages 45-46)			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-COM02, Objective 13			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(5) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
290001 Secondary CTMT Ability to monitor automatic operations of the SECONDARY CONTAINMENT including: A3.01 Secondary containment isolation	Tier #	2
	Group #	2
	K/A #	290001 A3.01
	Rating	3.9
	Rev / Date	0 / 10-12-2012

Question 59

The plant scrams from rated power due to a loss of feedwater.

- HPCS and RCIC automatically initiate
- Reactor water level has been recovered.

Which of the following is included among the isolation valves whose position indication has <u>changed status</u> (from OPEN to CLOSED) on the Isolation Valve Status Board?

A. B21-F019, INBOARD MSL DRAINS OUTBOARD DRAIN VALVE

B. P52-F221A, SERVICE AIR SUPPLY HEADER #1 TO AUX BLDG

C. E12-F008, RHR SHUTDOWN COOLING OUTBOARD SUCTION VALVE

D. P53-F026A, INSTRUMENT AIR SUPPLY HEADER TO AUXILIARY BUILDING

Answer: B

Explanation:

See the Automatic Isolations ONEP (05-1-02-III-5), “Automatic Isolations Checklist”.

‘A’ is wrong. This is a Group 1 PCIV. Group 1 valves don’t close until level lowers to Level 1 (-150.3”). HPCS and RCIC auto-initiate at Level 2 (-41.6”). Plausible because this is an isolation valve.

‘B’ is correct. This is a normally-open Auxiliary Building (Secondary Containment) isolation valve that closes at Level 2. See page 20 of the ONEP.

‘C’ is wrong. Normally closed at rated operation.

‘D’ is wrong. Gagged OPEN and will not close.

Technical References:

05-1-02-III-5, Automatic Isolations ONEP

References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-P5100, Objective 23			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295030 Low Suppression Pool Wtr Lvl / 5 Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: EA2.03 Reactor pressure	Tier #	1
	Group #	1
	K/A #	295030 EA2.03
	Rating	3.7
	Rev / Date	0 / 10-12-2012

Question 60

An ATWS and LOCA are in progress.

Which of the following conditions should cause operators to be **most** concerned about approaching the UNSAFE zone of HCTL?

A. High suppression pool level with low suppression pool temperature

B. Low suppression pool level with low reactor pressure

C. Low suppression pool temperature with high reactor pressure

D. Low suppression pool level with high reactor pressure

Answer: D

Explanation:

See EP-1, Figure 1, HCTL (Heat Capacity Temperature Limit).

'A' is wrong. High level with low temperature is a good thing. Plausible because the Applicant recall the HCTL curve (generally) and analyze it against this combination.

'B' is wrong. Low level with low reactor pressure is a good thing. Plausible because the Applicant recall the HCTL curve (generally) and analyze it against this combination.

'C' is wrong. Low temperature with high reactor pressure should cause operators to become more aware of HCTL. Plausible because the Applicant recall the HCTL curve (generally) and analyze it against this combination.

'D' is correct. When analyzing the slopes of the family of level curves, clearly operators should **most** concerned about violating HCTL.

Technical References:

EP-1, Figure 1, HCTL

References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-EP01, Objective 20			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
295004 Partial or Total Loss of DC Pwr / 6 G2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	Tier #	1
	Group #	1
	K/A #	295004 G2.1.7
	Rating	4.4
	Rev / Date	0 / 10-12-2012

Question 61

The plant is operating at rated power when the following occurs:

- 125VDC BTRY 1B3 SYS TROUBLE alarms and seals-in at P864
- CRO observes a 1B3 ground detector alarm on PDS
- Field operator confirms the alarm and reports the ground detector is reading 1.1 ma on the Positive side

Control room operators should immediately…

A. suspend all half-scram and half-isolations.

B. reduce core flow to 70 Mlbm/hr.

C. insert a manual scram.

D. declare HPCS inoperable.

Answer: A

Explanation:

See alarm response instruction 04-1-02-1H13-P864-2A-H4, Immediate Operator Action 3.5.1, requiring suspension of all half scram and half isolation surveillances. This makes choice 'A' correct.

At GGNS we have no ONEP (or other higher-tiered procedure) that speaks to battery grounds or Plant DC system trouble of any type. Certainly nothing that would require an immediate reduction in core flow or a manual scram. Thus 'B', 'C', 'D' are wrong, but plausible to some Applicants because they represent otherwise common actions found in the ONEPs.

Technical References:

04-1-02-1H13-P864-2A-H4, 125VDC BTRY 1B3 SYS TROUBLE

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-L1100, Objective 19			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	**Level**	RO
239002 SRVs Knowledge of RELIEF/SAFETY VALVES design feature(s) and/or interlocks which provide for the following: K4.04 Ensures even distribution of heat load to suppression pool, and adequate steam condensing	**Tier #**	2
	Group #	1
	K/A #	239002 K4.04
	Rating	3.4
	Rev / Date	0 / 10-12-2012

Question 62

Operators have opened 8 ADS SRVs.

Steam is being discharged into _____ of the suppression pool.

A. only one quadrant

B. only two quadrants

C. only three quadrants

D. all four quadrants

Answer: D

Explanation:

See GFIG-OPS-E2202, Figure 2 for the arrangement. For this reason, only 'D' is correct.

'A', 'B', 'C' are wrong for the reason 'D' is correct. Plausible to the Applicant who doesn't understand the need to evenly distribute the heat input to the pool.

Technical References:

GFIG-OPS-E2202, Figure 2

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-E2202, Objective 19.1

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No

Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
261000 Standby Gas Treatment System Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including system flow	Tier #	2
	Group #	1
	K/A #	261000 A1.01
	Rating	2.9
	Rev / Date	0 / 10-12-2012

Question 63

The following plant conditions exist:

- Reactor water level is -44”
- Drywell pressure is 1.20 psig
- SGTS Trains “A” and “B” are in AUTO

The hand switch for SGTS Train ‘B’ exhaust fan is then placed in the STOP position and **no** other SGTS-related controls are manipulated.

The resulting steady-state SGTS system total exhaust flow (i.e., considering both trains) is approximately:

A. 1950 scfm

B. 3875 scfm

C. 7750 scfm

D. 8600 scfm

Answer: C

Explanation:

‘A’ is wrong for the reason ‘C’ is correct. Plausible to the Applicant because who believes that the ‘B’ Train would in fact stop (it does not), and recalls the SGTS Section 5.2 SOI NOTE value of 3875 scfm, but fails to recall that this value is for each train, not the two trains operating together.

‘B’ is wrong for the reason ‘C’ is correct. Plausible to the Applicant who remembers that the exhaust fan will not stop with the -41.6” level present but who believes that the ‘B’ Train would in fact stop, in which case the total exhaust flow would be 3870 scfm (i.e., from the running ‘A’ Train fan).

‘C’ is correct because with the SGTS initiation signal present (-41.6”), placing the exhaust fan control hand switch for either train in the STOP position will not secure that fan. Therefore, both fans will continue to operate and maintain the discharge flow that it is set to provide in normal operation. The approximate system flow-rate is 3875 scfm per fan; i.e., ~7750 scfm total system flow (refer to the SGTS SOI, Section 5.2 NOTE on page 5 to verify the 3875 scfm).

‘D’ is wrong for the reason ‘C’ is correct. Plausible to the Applicant remembers that the exhaust fan will not stop with the -41.6” level present, <u>and</u> recalls the rated flow rate for each exhaust fan (4300 scfm), but fails to recall that each fan’s inlet has “flow control vanes” that modulate to maintain 3875 scfm flow.			
Technical References: GLP-OPS-T4801, SGTS lesson plan 04-1-01-T48-1, SGTS SOI			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-T4801, Objective 8.4			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
233000 Fuel Pool Cooling/Cleanup Ability to predict and/or monitor changes in parameters associated with operating the FUEL POOL COOLING AND CLEAN-UP controls including: A1.03 Pool temperature	Tier #	2
	Group #	2
	K/A #	233000 A1.03
	Rating	3.1
	Rev / Date	0 / 10-12-2012

Question 64

Per the Precautions/Limitations of SOI 04-1-01-G41-1, Fuel Pool Cooling and Cleanup System, which of the following is done to maximize resin efficiency?

Maintain FPCC heat exchanger outlet temperature…

A. above 70°F as read from G41-P001.

B. above 70°F as read from 1H13-P642.

C. below 140°F as read from G41-P001.

D. below 140°F as read from 1H13-P642.

Answer: C

Explanation:

Per 04-1-01-G41-1 P&L 3.1- FPCC heat exchanger outlet is to be maintained below 140F "as read on Chart Recorder TJR-R005 on G41-P001…to provide for maximum resin efficiency". This makes answer 'C' the only correct answer. The plausibility for the distracters lies in (1) the requirement of P&L 3.4 to limit pool temperature between 70 and 140 F and (2) the requirement of SOI step 5.6.2 to maintain fuel pool using reading on P642 in the main control room when lined up on RHR backup. 70 F also represents the temperature used for shutdown margin and criticality analysis for the spent fuel pool.

Technical References:

04-1-01-G41-1, FPCC SOI

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-G4146, Objective 14.1

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No

Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
241000 Reactor/Turbine Pressure Regulator Knowledge of the operational Implications of the following concepts as they apply to REACTOR/TURBINE PRESSURE REGULATING SYSTEM: K5.05 Turbine inlet pressure vs. turbine load	Tier #	2
	Group #	2
	K/A #	241000 K5.05
	Rating	2.8
	Rev / Date	1 / 11-14-2012

Question 65

A startup is in progress.

- The Main Generator is synchronized to the grid with load reference on.
- Turbine Steam Pressure Demand 935 psig
- Main Generator load is 180 MWe
- Load Demand is 200 MWe
- ‘A’ Main Bypass Control valve is 0% open

IOI-1 states to continue to raise reactor power by pulling rods.

Which of the following describes the response of the plant when reactor power is raised?

A. Turbine Stm Press Actual (N11-R600) indication at P680 will rise
Main Generator load will rise

B. Turbine Stm Press Actual (N11-R600) indication at P680 will rise
Main Generator load will remain the same

C. Turbine Stm Press Actual (N11-R600) indication at P680 will remain the same
Main Generator load will rise

D. Turbine Stm Press Actual (N11-R600) indication at P680 will remain the same
Main Generator load will remain the same

Answer: A

Explanation:

‘A’ is correct. The increase in reactor power raises reactor pressure and steam pressure sensed at the main steam equalizing header. This rise in steam pressure causes the EHC pressure regulator (IPC) to throttle open on the TCVs in order to maintain steam pressure at setpoint (Pressure Reference). Indicated Turbine Stm Press Actual at P680 rises, rather than return to it’s pre-power increase value, because the higher-than-previous pressure is necessary to maintain the TCVs in a throttled-open position (a function of how the “controller” known as the IPC works). The Main Turbine control valves will open due to being controlled by Load Reference,.

‘B’, ‘C’, ‘D’ are wrong for the reasons ‘A’ is correct. Their plausibility is based on Applicants who have not mastered the integrated plant concept that relates a change in reactor power to EHC system response (IPC pressure regulation) and the resulting dynamics of turbine inlet pressure as sensed as the main steam equalizing header.			
Technical References: 460000665 Steam Turbine-Generator Instruction Manual 03-1-01-1 Cold Shutdown to Generator Carrying Minimum Load IOI			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-N3202, Objective 12.1			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)(5)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
259001 Reactor Feedwater G2.1.30 Ability to locate and operate components, including local controls.	Tier #	2
	Group #	2
	K/A #	259001 2.1.30
	Rating	4.4
	Rev / Date	0 / 10-12-2012

Question 66

Operators are placing RPFT 'A' in Standby in preparation for placing it in service, using the Feedwater System SOI.

- Per the SOI, the CRO has just tested the turbine trip function (using the MAN TRIP pushbutton) and is waiting for the turbine to coast down to 0 rpm.
- RFPT 'A' speed has reached 0 rpm
- The CRO attempts to automatically engage the turning gear by depressing the 'A' TURN GEAR OPER RESET pushbutton.

What P680 light indications can the CRO use to OBSERVE that the turning gear <u>has</u> automatically engaged <u>and</u> its motor is running?

If the turning has <u>failed</u> to engage, how would a field operator attempt to manually engage it, per the SOI?

A. RED light above the OPER RESET pushbutton illuminates <u>and</u> the WHITE light above the RFPT 'A' TURN GEAR pushbutton extinguishes.

   Attempt to engage the gear by depressing the OPER RESET pushbutton at local panel P175 (Turbine Bldg, elevation 133').

B. RED light above the OPER RESET pushbutton illuminates <u>and</u> the WHITE light above the RFPT 'A' TURN GEAR pushbutton extinguishes.

   Attempt to engage the gear by pressing down on the Manual Engaging Lever at the RFPT.

C. GREEN light above the RFPT 'A' TURN GEAR pushbutton illuminates <u>and</u> the WHITE light above the RFPT 'A' TURN GEAR pushbutton illuminates.

   Attempt to engage the gear by depressing the OPER RESET pushbutton at local panel P175 (Turbine Bldg, elevation 133').

D. GREEN light above the RFPT 'A' TURN GEAR pushbutton illuminates <u>and</u> the WHITE light above the RFPT 'A' TURN GEAR pushbutton illuminates.

Attempt to engage the gear by pressing down on the Manual Engaging Lever at the RFPT.

Answer: B

Explanation:

At control room panel P680, RFPT 'A' has two pushbutton switches: RFPT 'A' TURN GEAR and 'A' TURN GEAR OPER RESET.

The first switch is associated with turning gear motor status. It has 3 individual pushbuttons (STOP, NORMAL, START) and 3 lights above it (GREEN, WHITE, RED). When the RFPT is running, this switch's NORMAL pushbutton has been depressed; its GREEN light is lit (indicating the turning gear motor is not running), its WHITE is extinguished (indicating the RFPT is running at a speed greater than 0 rpm), and its RED light is extinguished (indicating the turning gear motor is not running). **For this question, the light of attention is the WHITE light…it is lit whenever the RFPT speed is 0 rpm, otherwise it is extinguished.**

The second switch belongs to the turning gear logic. During normal RFPT operation (running), this logic is de-energized (happens by way of the same speed switch that feeds the WHITE light belonging to the first switch. As such, both the RED and GREEN lights above this second switch are normally extinguished (indicating that the logic is disabled). Per the SOI, when the RFPT is coasting down and reaches 0 rpm, the operator is directed to depress the OPER RESET pushbutton to enable the turning gear logic. The operator verifies that the gear has successfully by observing the following: the WHITE light has extinguished (because the turning gear has brought the RFPT speed above 0 rpm, and the RED light above the OPER RESET pushbutton illuminates (indicating that the gear has engaged).

For the above reasons, the first parts of choices 'A' and 'B' are correct.

'A' is wrong because of its second part. Although local panel P175 is associated with various RFPT 'A' controls/indications, it does not have the pushbuttons (described above) that control room panel P680 has.

'B' is correct. Its first part is correct for the reasons already discussed. Its second part is correct because the only other way to engage the gear is by pressing down on the Manual Engaging Lever at the RFPT, locally…this is directed by the SOI. (See SOI steps 4.5.2a(9) thru (11).

'C' and 'D' are wrong because there first parts suggest that the GREEN light (rather than the RED light) above the OPER RESET pushbutton illuminates.

Technical References:

04-1-01-N21-1, Feedwater System SOI.

References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-N2100, Objective 7.0			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(7) & (10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
290002 Reactor Vessel Internals Knowledge of the effect that a loss or malfunction of the REACTOR VESSEL INTERNALS will have on following: K3.07 Nuclear boiler instrumentation	Tier #	2
	Group #	2
	K/A #	290002 K3.07
	Rating	3.1
	Rev / Date	1 / 11-14-2012

Question 67

Which of the following indications would be affected by a loss of Below Core Plate Pressure?

A. Control Rod Drive cooling water differential pressure

B. High Pressure Core Spray line break detection instrumentation

C. All Jet Pump Flow Indication on Panel 1H13-P619.

D. Control Rod Drive, drive water differential pressure

Answer: C

Explanation:

A failure of the Below Core Plate Pressure would affect Jet pump flow indication and Core plate dp indication.

For the above reasons, ‘C’ is correct.

‘A’, ‘B’, and ‘D’ are wrong because these receive an input from Above Core Plate Pressure. These will be unaffected.

Technical References:

GLP-OPS-B3300, Recirc System lesson
P&ID M1077B

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-B2104, Objective 3.1

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No

Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(7)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
290003 Control Room HVAC Knowledge of the effect that a loss or malfunction of the following will have on the CONTROL ROOM HVAC: K6.04 Fire protection	Tier #	2
	Group #	2
	K/A #	290003 K6.04
	Rating	2.6
	Rev / Date	0 / 10-12-2012

Question 68

A loss of the fire protection _____(1)_____ will adversely impact the Control Room environment because _____(2)_____.

A. (1) Halon 1301 system
(2) there would be no way to automatically extinguish a fire in the Control Room Standby Fresh Air Unit Filter Trains.

B. (1) CARDOX system
(2) there would be no way to automatically extinguish a fire in the Control Room under-floor cable raceways.

C. (1) Deluge system
(2) there would be no way to extinguish a fire in the Control Room Standby Fresh Air Unit Filter Trains.

D. (1) Deluge system
(2) there would be no way to extinguish a fire in the Control Room under-floor cable raceways.

Answer: C

Explanation:

The Halon 1301 system, <u>not</u> CARDOX, is used to extinguish a fire in the control room sub-floor (cable raceways), only. The water system (deluge) is not used for sub-floor fire protection. Although there is a deluge system associated with extinguishing fires in the HVAC Standby Fresh Air Unit Filter Trains, it is a manual deluge, not an automatic one.

For these reasons, only choice ‘C’ is correct.

‘A’, ‘B’, ‘D’ are wrong for the reason ‘C’ is correct. Their plausibility speaks for itself.

Technical References:

04-S-01-P64-1, Fire Protection Water System SOI 04-S-01-P64-2, Fire Protection Halon System SOI			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-Z5100, Objective 13.6			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(7)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
262001 AC Electrical Distribution Ability to (a) predict the impacts of the following on the A.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.04 Types of loads that, if deenergized, would degrade or hinder plant operation	**Tier #**	2
	Group #	1
	K/A #	262001 A2.04
	Rating	3.8
	Rev / Date	1 / 11-14-2012

Question 69

The plant is operating at rated power.

Feeder breaker 52-15301 from bus 15AA to LCC 15BA3 trips (reason not yet known).

Per the operating procedures, what is the expected crew response?

A. Immediately insert a manual scram.

B. The SM/CRS may immediately direct an RO to attempt to reclose 52-15301 <u>one</u> time without delay.

C. Only <u>after</u> receiving a report from the field that Electricians have completed a full breaker inspection (even if cause of breaker trip has not yet been determined), the SM/CRS may direct an RO to attempt to reclose 52-15301.

D. Only <u>after</u> receiving a report from the field that there is no obvious cause of the breaker trip or other obvious condition that would make breaker re-closure unsafe, the SM/CRS may direct an RO to attempt to reclose 52-15301.

Answer: D

Explanation:

The Applicant is expected to recall that of the 6 LCCs powered from bus 15AA, only LCC 15BA3 ultimately delivers power (via an MCC and 120VAC power panel) to Auxiliary Building/CTMT/Drywell Isolation AOV solenoids, which includes P53-F001 (Instrument Air Supply Header To CTMT). Once recognized, the Applicant is expected to recall that P53-F001 is one such AOV that fails closed on loss of power, thereby cutting off the Instrument Air supply to CTMT, including the scram air header. Until such time that operators are able to restore power to the F001 solenoid and re-open F001 (at control room panel P870), the scram air header pressure bleeds down (normal leakage) and eventually (fairly quickly) the CRDM HCU scram inlet and outlet valves begin to drift open, allowing HCU accumulator pressure to begin drifting control rods inward. Upon entry into the CRD Malfunctions ONEP (05-1-02-IV-1), Immediate Operator Actions, section 2.3, directs us to immediately insert a manual scram if more than one control rod drifts.

‘A’ is wrong because the stem does not say anything about control rods yet drifting; therefore, CRD

ONEP Immediate Action 2.3 does not yet apply. Plausible to the Applicant who recognizes the inevitable rod drifts that will soon occur, but fails to recognize that until the CRD ONEP applies, we do not "Immediately insert a manual scram."

'B' is wrong because this provision (which used to be a NOTE associated with the Loss of AC Power ONEP) no longer exists. That former NOTE would allow operators to attempt to reclose an this LCC breaker one time without delay in a an effort to restore air to CTMT, re-pressurize the scram air header, and preclude having to manually scram in response to multiple rod drifts (per the CRD Malfunctions ONEP). Plausibility speaks for itself.

'C' is wrong. This choice is taken from procedure 02-S-01-27 (Operations Philosophy), Section 6.11 ("Restoration of Electrical Power for Circuit Breaker Trip")…specifically, step 6.11.1a(2). This choice is wrong because the conditions warranting a full breaker inspection are premised upon having determined the cause of the breaker trip. Plausibility speaks for itself.

'D' is correct. Operators are expected to invoke Section 6.11 of the Operations Philosophy procedure for any breaker trip. This choice suggests, specifically, step 6.11.3. That step allows the SM/CRS the option of attempting to reclose the breaker to restore critical plant functions (e.g., re-pressurizing the scram air header), but only after an "initial examination" of the cause of the breaker trip has been performed.

Technical References:

02-S-01-27, Operations Philosophy
05-1-02-I-4, Loss of AC Power ONEP
05-1-02-IV-1, CRD Malfunctions ONEP

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-PROC, Objective 4.0

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(5) & (10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
268000 Radwaste Knowledge of the effect that a loss or malfunction of the RADWASTE will have on following: K3.04 Drain sumps	Tier #	2
	Group #	2
	K/A #	268000 K3.04
	Rating	2.7
	Rev / Date	0 / 10-12-2012

Question 70

An electrical fault has caused G17-F001A and G17-F001B, Equipment Drain Collector Tank Inlet Valves, to fail CLOSED causing the AUX BLD EQ DRN TRANS TNK High Level annunciator in the Radwaste Control Room.

- DWL EQ DRN SMP DISCH/RECIRC VLV hand switches are in AUTO.
- DWL EQ DRN SMP Temperature is 87°F.
- DWL EQ DRN SMP Level is above the high setpoint.

Which of the following describes the affect this will have on the Drywell Equipment Drain Sump?

A. Both Drywell Equipment Drain Sump Discharge Valves (P45-F006A/B) OPEN
Both Drywell Equipment Drain Sump Recirc Valves (P45-F006C/D) CLOSE

B. Both Drywell Equipment Drain Sump Discharge Valves (P45-F006A/B) CLOSE
Both Drywell Equipment Drain Sump Recirc Valves (P45-F006C/D) OPEN

C. Both Drywell Equipment Drain Sump Discharge Valves (P45-F006A/B) CLOSE
Both Drywell Equipment Drain Sump Recirc Valves (P45-F006C/D) CLOSE

D. Only one Drywell Equipment Drain Sump Discharge Valve is (P45-F006A/B) OPEN
Only one Drywell Equipment Drain Sump Recirc Valve is (P45-F006C/D) OPEN

Answer: B

Explanation:

When the Auxiliary Building Equipment Drain Transfer Tank Hi Level annunciator comes in, the system isolates all inputs to the tank. This is accomplished in the Drywell Equipment Drain Sump by energizing relay 63x-3 K150 (Aux Building Eq Drain Transfer Tank High Level, E-1271-41). The logic is arranged such that when this relay energizes, it will energize SV-F513 through F516. With these SV's energized, the Drywell Equipment Drain Recirc valves are maintained OPEN and the Drywell Equipment Drain Discharge valves are maintained CLOSED. Thus answer 'B' is the only possible correct combination.

'A' would be selected by a student who does not remember that the Aux Bld Eq Dr Xfer Tnk

isolates all inputs on a hi level an wrongly assumes that as the DW sump fills both discharge valves would open in an attempt to lower sump level. This would be true for normal operation with a hi-hi level in the DW sump.

‘C’ would be selected by a student who knows that the discharge will be isolated, but wrongly believes that the recirc valves close when not needed to control sump temperature. The sump pump will start when sump temperature exceeds 120F. When the discharge valve is closed, the recirc valve is open. The position is not dependant on rather or not recirc is in use.

‘D’ describes normal operation and would be selected if the student does not remember that the Aux Bld Eq Dr Xfer Tnk isolates all inputs on a hi level.

Technical References:

J-0251-1, G17 EQ DRN COLLECTOR TANKS INLET VALVE
M-0039K, Liquid Radwaste System Units 1 & 2
M-1094C, Floor & Equipment Drains System
E-1271-41, P45 Floor and Equip Drains System Drywell Equip Drain Pumps Recirc & Disch Valves
E-1271-68, P45 Floor & Equipment Drains System Transfer Tank Level Switches
04-01-P45-1, Equipment Drain Sump System
GLP-OPS-P4500, Equipment Drain Sump System Lesson Plan

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-P4500, Objective 7.4

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)(4)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
295036 Secondary Containment High Sump/Area Water Level / 5	Tier #	1
	Group #	2
Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: EA1.02 Affected systems so as to isolate damaged portions	K/A #	295036 EA1.02
	Rating	3.5
	Rev / Date	0 / 10-12-2012

Question 71

A reactor scram on low water level has occurred.

The following alarms are received:

- P680-8A1-C1, TURB BLDG E FLOOR DR SMP LVL HI
- P680-8A1-D1, TURB BLDG W FLOOR DR SMP LVL HI
- P680-2A-E2, RFP A VIBR HI
- P680-2A-E12, RFP B VIBR HI

What is the **NEXT** operator action to protect plant facilities, personnel, and equipment from water damage?

A. Manually start the high capacity pumps for both Turbine Building Floor Drain Sumps.

B. Ensure that all Turbine Building Floor Drain Sump pumps are running.

C. Close B21-F065A and B21-F065B (FW INL SHUTOFF VLVs).

D. Secure all Condensate Pumps.

Answer: D

Explanation:

The student must recognize entry conditions for the Flooding ONEP. The first action of the Flooding ONEP is to “secure equipment and isolate leaks as necessary. Only answer ‘D’ will secure the leak by securing the equipment feeding the leak.

Answers ‘A’ and ‘B’ are also actions relating to later subsequent actions of the flooding ONEP; however, they do not represent the next action per the ONEP.

Answer ‘C’ does not isolate the leak and is not called for; however, a student who does not know or is unsure of the physical location of the F065 valves may choose this answer (These valves are in containment).

Technical References: 05-1-02-VI-1, Flooding ONEP			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-ONEP, Objective 2.0			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
2.1.36 Knowledge of procedures and limitations involved in core alterations.	Tier	3
	Group #	
	K/A #	2.1.36
	Rating	3.0
	Rev / Date	1 / 11-14-2012

Question 72

Which of the following would require continuous communication with the Refueling Platform and the Main Control Room?

A. Fuel movement in the Spent Fuel Pool

B. Fuel movement in the Containment Storage Pool

C. Fuel movement to the Horizontal Fuel Transfer machine

D. Fuel movement from one in-core position to another in-core postion

Answer: D

Explanation:

See 03-1-01-5 (Refueling), P/L 2.6, which states "Continuous communication will be maintained between the Control Room and Refueling Platform during Core Alterations.

For the above reason, only 'D' is correct.

'A', 'B', 'C' are wrong for the reason 'D' is correct. They are all plausible due to all are fuel movements but, per the definition of Core Alterations in Tech Specs these are core alterations.

Technical References:

03-1-01-5, Refueling IOI (IOI-5)
Tech Specs definitions

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-IOI5, Objective 2.5

Question Source:	Bank # (Held in NRC Exam Room computer)	X
(note changes; attach parent)	Modified Bank #	

	New	
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
2.2.39 Knowledge of less than or equal to one hour Technical Specification action statements for systems.	Tier #	3
	Group #	
	K/A #	2.2.39
	Rating	3.9
	Rev / Date	0 / 10-12-2012

Question 73

Which of the following is a "less than or equal to 1-hour" Tech Spec Required Action?

A. Operators determine that a Safety Limit has been violated.

B. HPCS is determined to be INOPERABLE while at rated power.

C. With the plant in MODE 2 and the reactor critical, operators determine that the Shutdown Margin is not within limits.

D. With reactor power at 50% during a power ascension, operators determine that MCPR is not within the COLR limits.

Answer: B

Explanation:

'A' is wrong per Tech Spec 2.2 (SL Violations)…this is a 2-hour Completion time. Plausible to the Applicant who cannot recall this fact (not uncommon, especially for RO Applicants).

'B' is correct per Tech Spec 3.5.1 (ECCS - Operating), Action B.1…a 1 hour Completion Time.

'C' is wrong per Tech Spec 3.1.1 (Shutdown Margin), Action A.1…a 6-hour Completion Time. Especially plausible to RO Applicants (who seldom think about SDM demonstrations).

'D' is wrong per Tech Spec 3.2.2 (MCPR) Action A.1…a 2-hour Completion Time. Again plausible especially to RO Applicants.

Technical References:

Tech Spec 2.2, SL Violations
Tech Spec 3.1.1, SDM
Tech Spec 3.2.2, MCPR
Tech Spec 3.5.1, ECCS - Operating.

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-TS001, Objective 39

Question Source:	Bank #	
*(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
	55.43(b)	

Examination Outline Cross-Reference	Level	RO
2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry level conditions for emergency and abnormal operating procedures. 55.41(10)	Tier #	3
	Group #	
	K/A #	2.4.4
	Rating	4.5
	Rev / Date	1 / 11-14-2012

Question 74

During a RCIC pump run for post-maintenance testing the following parameters exist:

- RCIC room temperature 135°F
- RCIC room radiation 45 mr/hr
- Suppression Pool level 18.84 ft.
- Suppression Pool temperature 91°F

Which of the following describes the actions of the crew?

A. Enter EP-3 only

B. Enter EP-4 only

C. Enter EP-3 and EP-4

D. Control Parameters using normal procedures

Answer: A

Explanation:

'A' is correct EP-3 should be entered due to High Suppression Pool level >18.81 ft..

'B' is wrong. The EP-4 (Aux Bldg Control) entry condition for the given RCIC parameters (Room Temp and Rad) is below the setpoint.

'C' is wrong. for the same reason for 'B'

'D' is wrong. because EP-3 entry condition has been exceeded.

Technical References:

05-S-01-EP-3, Containment Control
05-S-01-EP-4, Aux Bldg Control

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-EP3, Objective 5			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

Examination Outline Cross-Reference	Level	RO
2.4.25 Knowledge of fire protection procedures.	Tier #	3
	Group #	
	K/A #	2.4.25
	Rating	3.3
	Rev / Date	1 / 11-14-2012

Question 75

Which of the following describes the immediate affects a Loss of Plant Service Water will have on the Plant Fire Protection system?

A. Loss of Containment Fire protection

B. Loss of makeup water to the Fire Water Storage Tanks

C. Loss of Diesel Fire Pump Engine Cooling Water

D. Loss of All Fire pump seal water

Answer: B

Explanation:

Per 04-S-01-P64-1 P/L 3.2 “The loss of the Plant Service Water System Will result in the loss of makeup to the fire water storage tanks.”

‘B’ is correct. For the reasons stated above.

‘A’ is wrong but plausible due to another plant system, Condensate and Refueling water storage and Transfer System supplies fire protection water to the Primary Containment.

‘C’ is wrong but plausible due to the engine cooling water heat exchanger is supplied by the pump discharge.

‘D’ is wrong but plausible due to the pumps are self sealing.

Technical References:

04-S-01-P64-1, P/L 3.2

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-P6400, Objective 7.1			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)(10)		
	55.43(b)		

GGNS LOT 2012 NRC INITIAL LICENSED OPERATOR WRITTEN EXAMINATION
SRO EXAM

ANSWER KEY

76	D
77	A
78	B
79	A
80	C
81	B
82	A
83	B
84	C
85	D
86	C
87	A
88	C
89	D
90	D
91	B
92	A
93	B
94	D
95	C
96	C
97	B
98	B
99	A
100	A

Examination Outline Cross-Reference	Level	SRO
295001 Partial or Complete Loss of Forced Core Flow Circulation Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: AA2.05 Jet pump operability	**Tier #**	1
	Group #	1
	K/A #	295001 AA2.05
	Rating	3.4
	Rev / Date	1 / 11-14-12

Question 76

The plant is operating at rated power.

The CRS reviews the latest Jet Pump Operability Daily surveillance and discovers the following:

- Drive flows in each recirc loop versus their flow control valve positions differ by 9% from established patterns
- Total recirc loop drive flow versus total core flow differs by 12% from established patterns
- Jet Pump #7 indicated flow differs by 11% from established patterns

Why is the status of this surveillance Tech Spec Acceptance Criteria Unacceptable and what is the Tech Spec Required Action?

A. Because only <u>two</u> of the three stated criteria are <u>within</u> their limits; immediately enter Tech Spec LCO 3.0.3.

B. Because only <u>two</u> of the three stated criteria are <u>within</u> their limits; be in MODE 3 within 12 hours.

C. Because only <u>one</u> of the three stated criteria is <u>within</u> its limit; immediately enter Tech Spec LCO 3.0.3.

D. Because only <u>one</u> of the three stated criteria is <u>within</u> its limit; be in MODE 3 within 12 hours.

Answer: D			

Explanation:

See Tech LCO SR 3.4.3.1. So long as at least two of the three SR 3.4.3.1 criteria (a, b, c) are met, the jet pump remains OPERABLE.

The completed surveillance is Unacceptable because of the second and third criteria, both of which are beyond their 10% limits. This requires entry in LCO 3.4.3 and the Required Action of Condition A.1, which is to place the plant in MODE 3 within 12 hours.

For these reasons only choice ‘D’ is correct. Plausibility of the ‘A’, ‘B’, ‘C’ is evident.

Technical References: Tech Spec LCO 3.4.3 and SR 3.4.3.1			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-TS001, Objective 14			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank # (Held in NRC Exam Room computer)	X	
	New		
Question History:	Last NRC Exam	**YES (2011)**	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(2)		

Examination Outline Cross-Reference	Level	SRO
295031 Reactor Low Water Level / 2 2.2.40 Ability to apply Technical Specifications for a system.	Tier #	1
	Group #	1
	K/A #	295031 2.2.40
	Rating	4.7
	Rev / Date	0 / 10-12-12

Question 77

It is Day 8 of a refueling outage after a continuous run since the previous refueling outage.

- CORE ALTERATIONS have just begun
- RHR 'A' operating in Shutdown Cooling (SDC).
- An OPDRV causes an unplanned drain-down of the reactor cavity.

Operators isolate the source of the drain-down and cavity water level stabilizes at 4 feet above the RPV flange.

Until the reactor cavity water level has been restored to its pre-drain down level, what should be the CRS's **first** priority regarding the Tech Spec requirements for decay heat removal?

A. Verify that RHR 'B' is OPERABLE for SDC, or verify that the ADHR system is OPERABLE.

B. Verify that RHR 'B' is OPERABLE for SDC, or verify that RWCU is available for decay heat removal.

C. Verify that RHR 'A' is still OPERABLE for SDC, or verify that RWCU is available for decay heat removal.

D. Verify that RHR 'A' is still OPERABLE for SDC, or verify that the ADHR system is OPERABLE.

Answer: A

Explanation:

Refer to Tech Spec 3.9.8 (RHR – High Water Level). Before the unplanned drain-down, this decay heat removal LCO applies, requiring only one RHR subsystem (A or B) to be OPERABLE for SDC. However, after the drain-down, cavity water level is no longer ≥ 22'8" above the RPV flange, making LCO 3.9.9 (RHR – Low Water Level) now applicable. This LCO (3.9.9) requires that two RHR subsystems are OPERABLE for SDC, but allows the ADHR system to be substituted for one of the two RHR subsystems. This last mentioned fact is not evident when one reads only the LCO statement (for 3.9.9). Rather, the SRO Applicant is expected to recall that the LCO Bases discussion (on page B 3.9-30 of the Tech Spec Bases) clarifies that the LCO's statement…"Two decay heat removal subsystems shall be OPERABLE"…actually means both RHR subsystems (or ADHR as a substitute for one of them).

‘A’ is correct because with RHR ‘A’ SDC still OPERABLE and operating, the first attention the CRS should give to Tech Spec decay heat removal requirements is to verify that either RHR ‘B’ SDC or ADHR is OPERABLE. This attention ensures that LCO 3.9.9 is being satisfied.

‘B’ is wrong because it includes verification that RWCU is available for decay heat removal. At Day 8 of the outage following a continuous run since the preceding outage, there is still too much decay heat for RWCU to be considered available for decay heat removal (i.e., its decay heat removal is very limited when compared to RHR or ADHR).

‘C’ is wrong for two reasons: 1) it suggests that CRS only need verify that RHR ‘A’ is still OPERABLE for SDC (if it is, then no further concern is required), and 2) it too suggests that RWCU is available for handling the Day 8 decay heat load.

‘D’ is wrong because it suggests that the CRS has no additional concern if he has verifies that RHR ‘A’ SDC is still OPERABLE. This is not true, because this would verify that only one LCO 3.9.9 “decay heat removal subsystem” is OPERABLE…sufficient for LCO 3.9.8 but not for 3.9.9.

All three distracters are plausible because they each represent possible combinations for satisfying these LCOs.

Technical References:

LCO 3.9.8, RHR – High Water Level
LCO 3.9.9, RHR – Low Water Level and its Bases

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-TS001, Objective 40

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(2)	

Examination Outline Cross-Reference	Level	SRO
295013 High Suppression Pool Temp. / 5 2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	Tier #	1
	Group #	2
	K/A #	295013 2.2.25
	Rating	4.2
	Rev / Date	0 / 10-12-12

Question 78

The plant is operating at rated power.

Prolonged RCIC testing has forced the CRS to enter Tech Spec LCO 3.6.2.1, Suppression Pool Average Temperature.

What is the Tech Spec Basis for the COMPLETION TIME of the Required Action upon entering this LCO at this specific suppression pool temperature?

A. Allows adequate time to cool down the suppression pool to the point where LCO 3.6.2.1 can be exited.

B. Ensures the suppression pool's heat absorption capability is preserved without having to shut down the plant.

C. Ensures the reactor is shutdown before possibly heating up the suppression pool to beyond its design limits by the absorption of decay and sensible heat.

D. Allows adequate time to bring the plant down from full power conditions to the point where LCO 3.6.2.1 is no longer Applicable, doing so without challenging plant systems.

Answer: B

Explanation:

See LCO 3.6.2.1 and its Bases.

'A' is wrong because this is the Basis for Action A.1 which applies upon entering the LCO at its lowest limit of 95°F. See Bases page B 3.6-50. Plausible because it does describe the Basis of the Completion Time for entering the LCO at 95°F.

'B' is correct. See the LCO 3.6.2.1.b statement. The SRO Applicant is expected to recall that it isn't until pool temperature reaches >105°F that we enter this LCO while performing testing that adds heat to the pool. What's more, he is also expected to remember that the Basis for immediately suspending the testing is to ensure the pool's heat absorption capability is preserved without having to shut down the plant; see both the LCO Discussion (for part b) on Bases page 3.6-49 and the Action C.1 Discussion on Bases page B 3.6-51.

'C' is wrong because it describes the Basis for immediately placing the Mode Switch in SHUTDOWN if pool temperature reaches >110°F. See both the LCO Discussion (for pat c)

on Bases page 3.6-49 and the Action D.1 Discussion on Bases page B 3.6-51. Plausible because it does describe the Basis of the Completion Time for the 110°F limit of this LCO.

'D' is wrong because it describes the Basis for having to depressurize the plant and place it in MODE 4 (where this LCO is no longer Applicable) if pool temperature reaches >120°F. See the Bases Discussion for the E.1 and E.2 Actions on Bases page B 3.6-51. Plausible because it does describe the Basis of the Completion Time for the 120°F limit of this LCO.

Technical References:

Tech Spec LCO 3.6.2.1, Suppression Pool Average Temperature
Tech Spec Bases for LCO 3.6.2.1

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-TS001, Objective 40

Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(2)		

Examination Outline Cross-Reference	Level	SRO
295035 Secondary Containment High Differential Pressure / 5 Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: EA2.01 Secondary containment pressure	**Tier #**	1
	Group #	2
	K/A #	295035 EA2.01
	Rating	3.9
	Rev / Date	0 / 10-12-12

Question 79

That plant is operating at rated power when a Secondary Containment equipment hatch begins to leak.

As a result, Auxiliary Building D/P begins to slowly degrade.

Currently, the D/P is -0.20" w.c. and slowly degrading.

What is the proper interpretation of this current condition regarding Secondary Containment OPERABILITY?

A. The Secondary Containment is still OPERABLE (per LCO 3.6.4.1, Secondary Containment) because operators have not yet determined whether or not SGTS is able to restore the Aux Bldg to its required D/P.

B. The Secondary Containment is still OPERABLE (per LCO 3.6.4.1, Secondary Containment) because an EP-4 (Aux Bldg Control) is not yet required.

C. The Secondary Containment is INOPERABLE (per LCO 3.6.4.1, Secondary Containment) because Aux Bldg Ventilation (T41) is not OPERABLE.

D. The Secondary Containment is INOPERABLE (per LCO 3.6.4.1, Secondary Containment) because the required D/P is not being maintained.

Answer: A

Explanation:

See LCO 3.6.4.1 and its Bases.

'A' is correct because even though the 3.6.4.1 Bases "LCO" Discussion, specifically at the top of page B 3.6-85 require Secondary Containment to be leak tight enough to maintain required vacuum, this is based on SGTS ability to draw down this vacuum not Aux Building Ventilation. Therefore, Secondary Containment will only become INOPERABLE if SBGT is unable to drawdown and maintain vacuum within the required time. See also SR 3.6.4.1.3 and 3.6.4.1.4.

'B' is wrong because it suggests a connection between LCO 3.6.4.1 OPERABILITY and whether or not D/P has degraded to "Above 0.0" w.c." which is the EP-4 entry. There is no such connection.

‘C’ is wrong because it suggests that Secondary Containment is INOPERABLE “because the normal building ventilation (T41) is not OPERABLE. The fact that the T41 system is not able to keep up with the leakage is one thing, but T41 is not a Tech Spec system; therefore, OPERABLE/INOPERABLE doesn’t apply to that system (unlike the SGTS system (T48) which is a Tech Spec system (with its own LCO 3.6.4.3) and whose OPERABILITY is directly linked to Secondary Containment OPERABILITY per LCO 3.6.4.1.

‘D’ is wrong. Plausibility is based on the explanation for answers ‘A‘ and ‘C’, but a less competent student may assume that degrading vacuum constitutes INOPERABILITY without considering the bases that SGTS maintains the vacuum.

Technical References:

Tech Spec LCO 3.6.4.1, Secondary Containment
LCO 3.6.4.1 Bases

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-TS001, Objective 40

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(10)	

Examination Outline Cross-Reference	Level	SRO
600000 Plant Fire On Site / 8 Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: AA2.14 Equipment that will be affected by fire suppression activities in each zone	Tier #	1
	Group #	1
	K/A #	600000 AA2.14
	Rating	3.6
	Rev / Date	0 / 10-12-12

Question 80

Use your provided references to answer this question.

A fire is in progress in fire zone 1A221.

That zone's fire suppression system has automatically gone into service.

Which of the following describes how the fire suppression system is impacting plant SAFE SHUTDOWN equipment?

A. The LPCI 'B' Injection Valve (E12-F042B) drive motor is being wetted down by fire water.

B. The SSW Inlet Valve To DG12 Water Cooler (P41-F018B) drive motor is immersed in CO2.

C. Cabling for Battery Charger 1B5 is immersed in CO2.

D. Cabling for DG12 Outside Air Fan (X77-C001B) is being wetted down by fire water.

Answer: C

Explanation:

See GGNS Fire Pre-Plan, Volume 1, specifically pre-plan A-16, where we see that Total CO2 Flooding is the <u>only</u> automatic fire suppression for Zone 1A221. See procedure 10-S-03-2, Response To Fires, Attachment IV, page 56 of 83, for Zone 1A221, where we find the Safe Shutdown Equipment (or cabling for such) located in that zone. See the same procedure, Attachment III, page 1 of 2, specifically "General Note" #2, which explains the use of the 'C' and 'D' designators for the equipment in each Attachment IV fire zone.

'A' is wrong for two reasons: 1) it suggests that the E12-F042B valve itself is located in this zone; it is not, as shown by the 'C' designator, and 2) it suggests that this zone has an automatic fire water suppression system; it does not. Plausibility speaks for itself.

'B' is wrong is because it suggests that the P41-F018B valve itself is located in this zone; it is not, as shown by the 'C' designator. Plausibility speaks for itself.

'C' is correct because only cabling for, not the 1B5 charger itself, is located in this zone ('C' designator), and this zone uses an automatic CO2 flooding system.

'D' is wrong because it suggests that the cabling for the DG12 Outside Air Fan is being wetted down by an automatic fire water suppression system; it is not, rather it is CO2. Plausibility speaks for itself.
Technical References: GGNS Fire Pre-Plans, Volume 1 10-S-03-2, Response To Fires
References to be provided to applicants during exam: 10-S-03-2: cover page; Attachment III, both pages; Attachment IV, pages 50 through 60 GGNS Fire Pre-Plans Volume 1: cover page; all 8 pages of the "INDEX ROOM NUMBER" section; pre-plans A-14 through A-18
Learning Objective: GLP-OPS-PROC, Objective 58

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(5)	

Examination Outline Cross-Reference	Level	SRO
256000 Reactor Condensate G2.4.6 Knowledge of EOP mitigation strategies	Tier #	2
	Group #	2
	K/A #	256000 2.4.6
	Rating	4.7
	Rev / Date	0 / 10-12-12

Question 81

Operators have just entered EP-2A, ATWS RPV Control.

Upon initial entry into the Level Leg of EP-2A, the following conditions exist:

- Reactor power is 12%
- MSIVs are open
- Suppression pool temperature is 98°F
- Drywell pressure is 1.3 psig and slowly rising
- RPV water level is +5” and slowly lowering
- RPV pressure is 850 psig and slowly lowering

Operators have just terminated RPV injection at P680 for the first time; RCIC is injecting and CRD has been maximized for flow.

With P680 injection still terminated, RPV water level is now -80” and continuing to lower.

Neither RFPT will re-start (cause unknown).

The CRS should NEXT direct operators to lower reactor pressure to a band of 450 psig to 600 psig using …

A. SRVs then re-inject to the RPV using Condensate to maintain a level band of -70” to -130”.

B. Bypass Valves then re-inject to the RPV using Condensate to maintain a level band of -70” to -130”.

C. SRVs then re-inject to the RPV using Condensate to maintain a level band of -70” to -191”.

D. Bypass Valves then re-inject to the RPV using Condensate to maintain a level band of -70” to -191”.

Answer: **B**			

Explanation:

See the Level Leg of the EP-2A flowchart. Given the plant conditions that exist “upon initial

entry into the Level Leg of EP-2A", the CRS should initially make the following decision at override step L-5…proceed to step L-7 to lower level and establish a "Nominal" level band of -70" to -130". Until level cannot be maintained in this band, the "Maximum" band of - 70" to -191" (permitted by Step L-7) is not warranted. With the MSIVs open, the preferred way to reduce pressure to within the discharge head of the Condensate Booster Pumps is via the turbine Bypass Valves, not via the SRVs.

For these reasons, only choice 'B' is correct.

'A', 'C', 'D' are wrong for the reason 'B' is correct. Plausibility speaks for itself as described above.

Technical References:

EP-2A, ATWS RPV Control
02-S-01-27, Operations Philosophy

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-EP02A, Objective 3

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(5)	

Examination Outline Cross-Reference	Level	SRO
2.4.16 Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.	Tier #	3
	Group #	
	K/A #	2.4.16
	Rating	4.4
	Rev / Date	1 / 11-14-12

Question 82

A LOCA is in progress.

Currently:

- 8 ADS Valves are open
- HPCS is injecting at 4,500 gpm
- LPCS is injecting at 4,000 gpm
- All other available systems have been maximized for injection
- RPV water level is -205" and slowly lowering
- CTMT pressure is 20 psig and slowly rising

The CRS should…

A. exit the EPs and enter the SAPs.

B. enter Steam Cooling.

C. vent the CTMT using the small (6") vent valves.

D. remain in the EPs until RPV level reaches -217", then exit the EPs and enter the SAPs

Answer: **A**			

Explanation:

See the EP-2, RPV Control, flowchart.

'A' is correct per Level Leg step L-14 of EP-2, where we see that we have satisfied the IF-AND-THEN statement in that step…i.e., Level cannot be restored and maintained above -191", **AND** Spraying Cooling cannot be established (i.e., even though we have a total injection flow of 8,500 gpm from HPCS and LPCS, spray cooling requires that we have above 7,000 gpm from either HPCS alone, or LPCS alone), **AND** we have maximized injection with all available sources. As such, step L-14 tells us to exit the EPs and enter the SAPs.

'B' is wrong for the reason 'A' is correct. Steam Cooling is an EP-2 contingency leg. The L-14 direction to exit the EPs and enter the SAPs trumps Steam Cooling. Plausible based on this Exam Authors repeated experience with SRO Applicants often confusing the "Steam Cooling" mitigation strategy with the "Spray Cooling" mitigation strategy.

‘C’ is wrong for the reason ‘A’ is correct. This distracter comes from the CTMT Pressure Leg of EP-3, Containment Control, specifically steps PCP-7 and PCP-8. This is historically a strong distracter because all Applicants can recall the need to vent the CTMT through the large valves (i.e., the Attachment 13 referred to in step PCP-8). And the stem condition that shows CTMT pressure already reaching 19.0 psig makes the apparent urgency for venting the CTMT even more inviting.

‘D’ is wrong for the reason ‘A’ is correct. This distracter comes from step L-14 of EP-2, where the criteria for Spray Cooling is…the necessary 7,000 gpm injection from HPCS alone or from LPCS alone AND RPV level above -217”. Again, in this Exam Authors experience this is a strong distracter to many SRO Applicants who are weak in both recalling the meaning of Spray Cooling and in recalling the EP exit points. With the stem conditions indicating that RPV level has already reached -205” we are still above -217”; as such, this distracter is very inviting to those Applicants.

Technical References:

EP-2, RPV Control flowchart
EP-3, Containment Control flowchart

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-EP02, Objectives 3 & 6

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(5)	

Examination Outline Cross-Reference	Level	SRO
2.2.14 Knowledge of the process for controlling equipment configuration or status.	Tier #	3
	Group #	
	K/A #	2.2.14
	Rating	4.3
	Rev / Date	0 / 10-12-12

Question 83

Which of the following is considered a temporary modification **required** to be controlled by EN-DC-136, Temporary Modifications?

A. Following an engineering evaluation and approval, a seismic class 1 support is temporarily removed to accommodate a maintenance activity.

B. Due to outage activities, a temporary feed is connected to MCC 11B12 to supply its loads.

C. Temporary scaffolding is installed over a reactor feedwater pump.

D. A circuit board is temporarily removed to support an electrical test.

Answer: B

Explanation:

See EN-DC-136, specifically Attachment 9.2, Part II, Exclusions, Sheet 1 of 4, Part I – SCREENING, and Part II – EXCLUSIONS.

'A' is wrong because Exclusion #9 applies to this activity.

'B' is correct because its activity is not found on the list of Exclusions.

'C' is wrong because Exclusion #8 applies to this activity.

'D' is wrong because Exclusion #11 applies to this activity.

The plausibility of 'A', 'C', 'D' speaks for itself.

Technical References:

EN-DC-136, Temporary Modifications

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-PROC, Objective 40.5

Question Source:	Bank # (Held in NRC Exam Room computer)	X

(note changes; attach parent)	Modified Bank #	
	New	
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(3)	

Examination Outline Cross-Reference	Level	SRO
2.3.13 Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	Tier #	3
	Group #	
	K/A #	2.3.13
	Rating	3.8
	Rev / Date	1 / 11-14-12

Question 84

Per EN-RP-101, Access Control For Radiologically Controlled Areas, who is **required** to give the **final** approval for personnel to enter a Locked High Radiation Area (LHRA) with general area dose rates greater than 1.5 Rem/hr in the actual work area?

A. Plant Operations General Manager

B. Radiation Protection Supervisor

C. Radiation Protection Manager

D. Operations Manager

Answer: C

Explanation:

See EN-RP-101, Section 5.5[10], 1st bullet at the top of page 18.

'A' is wrong. Per the above reference, the RPM's approval is required.

'B' is wrong. Per the above reference, the RPM's approval is required.

'C' is correct. Per the above reference, the RPM's approval is required.

'D' is wrong. Per the above reference, the RPM's approval is required.

'A', 'B', 'D' are all as plausible, as is 'C', to the SRO Applicant who has never attended much to this procedure and who can only recall small amounts of information about LHRA access described in Administrative Controls Section 5.7 of GGNS Tech Specs.

Technical References:

EN-RP-101, Access Control For Radiologically Controlled Areas

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-PROC, Objective 50

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	

	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(4)	

Examination Outline Cross-Reference	Level	SRO
2.2.40 Ability to apply Technical Specifications for a system.	Tier #	3
	Group #	
	K/A #	2.2.40
	Rating	4.7
	Rev / Date	1 / 11-14-12

Question 85

A support system has been declared inoperable and its Tech Spec LCO has been entered.

CRS/SM:

- Determines there is no need to enter and implement the Conditions and Required Actions for that supported system's LCO.

A Safety Function Determination must however be performed per Tech Spec 5.5.10.

Which Tech Spec LCO provides for the allowances described above?

A. LCO 3.0.1

B. LCO 3.0.3

C. LCO 3.0.5

D. LCO 3.0.6

Answer: D			

Explanation:

See LCO 3.0.6 Bases, specifically pages B 3.0-7 & 8.

Per the Bases discussion, only choice 'D' is correct.

'A' is wrong. LCO 3.0.1 establishes the Applicability statement within each LCO (see Bases page B 3.0-1. Plausible to the Applicant who is weak on differentiating between the various 3.0 LCOs.

'B' is wrong. LCO 3.0.3 establishes the ACTIONS that are necessary when an LCO is not met, or when no other LCO Condition applies. Plausible to the Applicant who is weak on differentiating between the various 3.0 LCOs.

'C' is wrong. LCO 3.0.5 establishes the allowance restoring equipment to service under administrative controls when it has been removed from service or declared inoperable to comply with ACTIONS. Plausible to the Applicant who is weak on differentiating between

the various 3.0 LCOs.			
Technical References: Tech Spec LCOs 3.0.1, 3.0.2, 3.0.5, 3.0.6			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-TS001, Objective 20			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(2) & (5)		

Examination Outline Cross-Reference	Level	SRO
295023 Refueling Acc / 8 Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS: AA2.05 Entry conditions of emergency plan	**Tier #**	1
	Group #	1
	K/A #	295023 AA2.05
	Rating	4.6
	Rev / Date	0 / 10-12-12

Question 86

Use your provided references to answer this question.

The plant is in MODE 5 with refueling activities in progress.

Highest peak reading of Area Radiation Monitors (ARMs) over the past 24 hours:

- CTMT Fuel Handling Area (D21-K626 thru K629) 4.5 mR/hr
- CTMT 209 Airlock (D21-K630) 1.5 mR/hr

Which of the following situations, alone, would require entry into the Emergency Plan?

A. CTMT 209 Airlock alarm (P844-1A-A1) with ARM D21-K630 reading below the annunciator alarm setpoint.

B. An unplanned rise of the reading on ARM D21-K626 to a level of 900 mR/hr; the reading has been validated.

C. Polar crane drops a piece of equipment on a spent fuel bundle in the transfer canal; a valid CTMT Fuel Handling Area alarm (P844-1A-A3) is received.

D. An OPDRV results in an uncontrolled lowering of Upper CTMT Pool levels; the level drop is halted before fuel is uncovered or there is any rise in ARM readings.

Answer: C

Explanation:

'A' is wrong because the alarm in not a VALID one, as defined by 10-S-01-1, section 5.59. EAL AA2 (Abnormal Radiation Levels) requires the alarm to be VALID. Plausibility is based on the need for the SRO Applicant to recall what the meaning of VALID.

'B' is wrong 900 mr/hr is both less than full-scale for the ARM (full-scale = 1000 mr/hr) and less than 1000 times the highest peak reading over the past 24 hours (stem shows this to be 4.5 mr/hr, where 1000 times would = 4500 mr/hr). Plausibility is based on the SRO Applicant's need to assess meaning of the 900 mR/hr ARM reading.

'C' is correct because it satisfies the threshold for declaring an ALERT per EAL AA2.

’D’ is wrong EAL AU2 doesn’t apply unless the level drop is accompanied by a valid rise in an ARM reading. Plausibility is based on the SRO Applicant’s need to correctly interpret EAL AU2.
Technical References: EALs AU2 and AA2 10-S-01-1, Activation of the Emergency Plan
References to be provided to applicants during exam: EAL flowcharts (no Bases)
Learning Objective: GLP-EP-EPTS6, Objective 1

Question Source:	Bank # (Held in NRC Exam Room computer)	X
(note changes; attach parent)	Modified Bank #	
	New	
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(5)	

Examination Outline Cross-Reference	Level	SRO
295024 High Drywell Pressure / 5 2.1.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	Tier #	1
	Group #	1
	K/A #	295024 2.1.25
	Rating	4.2
	Rev / Date	0 / 10-12-12

Question 87

The plant is operating at rated power.

A partial loss drywell cooling causes:

- Drywell pressure to rise to 0.7 psig and stabilize there.
- CTMT pressure is unchanged.

What is the Basis for the Tech Spec LCO limit associated with this specific condition?

A. Helps protect against the horizontal vents clearing during normal plant operating conditions.

B. Helps protect against weir wall overflow should an inadvertent SPMU dump occur during normal operating conditions.

C. Helps protect against an unacceptable delay in the clearing of the top horizontal vent (resulting in an unacceptably high peak drywell pressure) during a LOCA.

D. Helps ensure that suppression pool swell has a minimal impact on pool load limits during a LOCA.

Answer: **A**			

Explanation:

See Tech Spec LCO 3.6.5.4, Drywell Pressure and its Bases.

'A' is correct. Refer to the "Background" discussion on Bases page B 3.6-120, where we find that the **positive** DW-to-CTMT d/p limit (+2.0 psid) ensures that horizontal vent clearing does not occur during normal plant operating conditions.

'B' is wrong. Refer to the "Background" discussion on Bases page B 3.6-120, where we find that the negative DW-to-CTMT d/p limit (-0.25 psid) minimizes the probability of a weir wall overflow resulting from an inadvertent SPMU dump during normal plant operating conditions.

'C' is wrong. Again, refer to the same "Background" discussion, where we find that the negative d/p limit protects an excessive delay in the clearing of the top horizontal vent (and therefore an unacceptably high peak DW pressure) during a LOCA.

‘D’ is wrong. This choice comes from a combination of both the LCO Bases (specifically the “Applicable Safety Analysis” discussion on page B 3.6-120) and Section 6.2.1.1.6, specifically page 6.2-40 of the UFSAR. It’s in the UFSAR discussion (for Case ‘C’), i.e., negative DW-to-CTMT d/p, that we find the LCO’s lower limit (-0.25 psid) helps to ensure that the supp pool swell that would occur during a LOCA will have minimal impact on the analyzed pool load limit.

‘B’, ‘C’, ‘D’ are all plausible because they each represent the analyses and Bases associated with LCO 3.6.5.4.

Technical References:

Tech Spec LCO 3.6.5.4, Drywell Pressure
Tech Spec LCO 3.6.5.4 Bases
UFSAR Section 6.2.1.1.6, Suppression Pool Dynamic Loads

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-TS001, Objective 40

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	X
	Comprehensive/Analysis	
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(2)	

Examination Outline Cross-Reference	Level	SRO
295004 Partial or Total Loss of DC Pwr / 6 2.4.41 Knowledge of the emergency action level thresholds and classifications.	Tier #	1
	Group #	1
	K/A #	295026 2.4.41
	Rating	4.6
	Rev / Date	0 / 10-12-12

Question 88

Use your provided references to answer this question.

The plant is operating at rated power when a loss of all offsite power occurs.

When the plant scrammed, the following occurred:

- An unexplained loss of 11DA bus
- 16AB is locked out due to overcurrent (bus damage occurred)
- LOCA in the drywell

20 minutes after the scram:

- An operator reports that 11DB bus voltage is 104 VDC
- A fire is reported in the Division 3 battery room (11DC is de-energized)
- Security determines and reports that the loss of offsite power was the result of HOSTILE ACTION in the Switchyard.

40 minutes after the scram:

- The fire in Division 3 battery room continues to burn
- Drywell pressure has reached 1.40 psig and is slowly trending upward
- Reactor water level is -120” trending down

The CRS/SM should make an EAL declaration at the _____ level.

A. Unusual Event

B. Alert

C. Site Area Emergency

D. General Emergency

Answer: C			

Explanation:

See the EAL flowchart.

‘A’ is wrong. Given the stem conditions regarding the loss of offsite power, this choice

attempts to distract the SRO Applicant towards the UE level, specifically EAL SU1 and HU1, which would be the case were it not for other conditions given in the stem. Plausibility speaks for itself.

'B' is wrong. This choice attempts to distract the SRO Applicant towards the ALERT level, based on the HOSTILE ACTION Security Event and Drywell pressure described in the stem. Specifically, EAL HA1b, where the SRO Applicant recognizes that the Switchyard is within the "Owner Controlled Area" as identified in that EAL and RC1(FA1) Drywell Pressure > 1.39 psig. Again, this would be the correct declaration were it not for other information given in the stem. Plausibility speaks for itself.

'C' is correct. The SRO must determine that EAL SS4 parameters are met by virtue of loss of all vital DC busses (11DA, 11DB, 11DC). This meets EAL SS4 for a Site Area Emergency

'D' is wrong. This choice attempts to distract the Applicant towards the GE level, specifically Fission Product Barrier EAL FG1 when considering the LOCA-related information given in the stem. However, FG1 is not yet met (Fuel Clad is intact). Also, a Hostile Action on site could lead an operator to select EAL HG1. Plausibility speaks for itself.

Technical References:

EAL flowcharts (part of 10-S-01-1, Activation of the Emergency Plan)

References to be provided to applicants during exam:

EAL flowcharts (no Bases)

Learning Objective: GLP-EP-EPTS6, Objective 1

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(5)	

Examination Outline Cross-Reference	Level	SRO
295011 High Containment Temp / 5	Tier #	1
	Group #	2
2.4.6 Knowledge of EOP mitigation strategies.	K/A #	295011 2.4.6
	Rating	4.7
	Rev / Date	0 / 10-12-12

Question 89

A small-break LOCA and an ATWS are in progress.

Currently:

- Reactor power is 0%
- SLC is injecting with SLC tank level at 950 gallons and lowering
- CRD flow is maximized
- RCIC is injecting
- Operators are attempting to re-inject with Condensate/Feedwater but two Condensate Booster Pumps keep tripping off (reason unknown)
- RPV water level is -180" and stable
- Suppression pool level is 18.5 feet and slowly rising
- CTMT pressure is 3.0 psig and slowly rising
- CTMT temperature is 185°F and slowly rising
- Drywell temperature is 215°F and slowly rising
- CTMT pressure is in the Safe to Initiate zone of the CSIPL (Fig 3)

The CRS should direct operators to…

(For each answer choice, assume that action has <u>not</u> yet been performed.)

A. Emergency Depressurize based on RPV water level.

B. Emergency Depressurize based on PSP.

C. Initiate CTMT Sprays based on Drywell temperature.

D. Initiate CTMT Sprays based on CTMT temperature.

Answer: **D**			

Explanation:

See EP-2A(ATWS RPV Control) and EP-3 (Containment Control).

'A' is wrong. Per the Level Leg of EP-2A, an Emergency Depressurization (ED) is <u>not</u>

required until operators are unable to restore and maintain level above -191” using only Table 4 systems (Condensate/Feedwater, CRD, and RCIC at this point). With the stem indicating that level is has only lowered to -180”, an early ED would not be a correct decision. A student would be tempted to ED when level is below TAF (-167”) in order to use low pressure ECCS systems to raise level above TAF.

‘B’ is wrong. The SRO Applicant is expected to recognize that with a near normal suppression pool level (18.5 feet) and a CTMT pressure still only 3.0 psig and slowly rising, we are still well in the SAFE region of PSP (Figure 4) and with 0% reactor power PSP is not expected to be exceeded. Plausibility speaks for itself.

‘C’ is wrong. The SRO Applicant is expected to recall that there is no relationship between the need to ED and DW temperature by itself. To make this distracter more plausible, we’ve chosen a DW temperature of 215°F, which is above the 185°F CTMT temperature for which we would initiate CTMT Sprays in an attempt to restore and maintain CTMT temperature, rather than having to ED. Plausibility speaks for itself.

‘D’ is correct. Per the CTMT Temperature Leg of EP-3, we will initiate CTMT Sprays to control CTMT temperature before we ED. The SRO Applicant is expected to recognize that ED is required if CTMT temperature cannot be restored and maintained below 185F. The SRO should then attempt to restore CTMT temperature using CTMT Spray.

Technical References:

EP-1 Figure 4 (PSP) and Figure 3 (CSIPL)
EP-2A, ATWS RPV Control flowchart
EP-3, Containment Control flowchart

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-EP3, Objective 3

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(5)	

Examination Outline Cross-Reference	Level	SRO
212000 RPS Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.01 RPS motor-generator set failure	**Tier #**	2
	Group #	1
	K/A #	212000 A2.01
	Rating	3.9
	Rev / Date	1 / 11-14-12

Question 90

The plant is operating at 70% power when:

- B21-F022B, MSL B DRWL INBD ISOL valve Division 2 solenoid is failed (solenoid de-energized)
- The 'A' RPS motor-generator trips off.
- RPS 'B' is being supplied by its alternate source.
- After B21-F022B closes, the operator places the hand switch for this valve in the closed position.

As a result…

A. (1) B21-F022B will slowly drift closed as Instrument air bleeds off.
(2) The CRS will direct actions of the Loss of One or Both RPS buses ONEP to reset the ½ scram and then enter 04-1-01-B21-1, Nuclear Boiler System SOI to re-open B21-F022B.

B. (1) B21-F022B will immediately close
(2) The CRS will direct actions of the Loss of One or Both RPS buses ONEP only to reset the ½ scram and to re-open B21-F022B.

C. (1) B21-F022B will slowly drift closed as Instrument air bleeds off.
(2) The CRS will direct actions of the Loss of One or Both RPS buses ONEP only to reset the ½ scram and to re-open B21-F022B.

D. (1) B21-F022B will immediately close
(2) The CRS will direct actions of the Loss of One or Both RPS buses ONEP to reset the ½ scram and then enter 04-1-01-B21-1, Nuclear Boiler System SOI to re-open B21-F022B.

Answer: D			

Explanation:

The MSIV's are designed with two solenoid valve actuators per MSIV one is powered from RPS bus 'A' and the other from RPS bus 'B' (E-1160-53). When both of these solenoids are de-energized by an actual isolation or hand switch close signal the Instrument air to the MSIV is isolated and vented resulting in an immediate closure. The applicant who mistakenly remembers that when Instrument Air is lost to the MSIVs they slowly drift closed is likely to select either answer A or C.

The CRS must enter the Loss of One or Both RPS buses ONEP to reset the scram; however, this ONEP states that the 04-1-01-B21-1, Nuclear Boiler System SOI must be used to re-open a closed MSIV.

Technical References:

E-1160-53
04-1-01-B21-1, Nuclear Boiler System SOI
05-1-02-III-2, Loss of One or Both RPS buses ONEP

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-ONEP, Objective 2

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(2)	

Examination Outline Cross-Reference	Level	SRO
218000 ADS 2.2.37 Ability to determine operability and/or availability of safety related equipment.	Tier #	2
	Group #	1
	K/A #	218000 2.2.37
	Rating	4.6
	Rev / Date	0 / 10-12-12

Question 91

The plant is operating at rated power when the latest Quarterly ADS Channel Functional Test indicates the following:

- The ADS Trip System 'A' Initiation Timer is timing out at 118 seconds
- The ADS Trip System 'B' Initiation Timer is timing out at 104 seconds

The surveillance Acceptance Criteria for these timers is "≤105 seconds".

A Condition Report (CR) has been initiated to document this condition.

What Operability Code should be assigned to the **initial** screening of this CR in PCRS?

A. OPERABLE

B. INOPERABLE

C. EQUIPMENT FUNCTIONAL

D. EQUIPMENT NON-FUNCTIONAL

Answer: B

Explanation:

Per the associated surveillance procedure, the "Acceptance Criteria" for these timers is "≤105 seconds". Stem conditions indicate that the Trip system 'A' Initiation Timer is higher than the maximum "Allowable Value" of 117 seconds. The Trip System 'B' timer (indicating 104 seconds), however, is well within the limit and is within the Acceptance Criteria for the surveillance.

See EN-OP-104, section 3.0[19] for the Operability Codes. INOPERABLE is for a Tech Spec SSC that is not OPERABLE. EQUIPMENT NON-FUNCTIONAL is for a non-Tech Spec SSC is not FUNCTIONAL. OPERABLE is for a Tech Spec SSC that is OPERABLE. FUNCTIONAL is for a non-Tech Spec SSC that is FUNCTIONAL.

Applicant is expected to recognize that "Functionality" (see OP-104 Section 3.0[12] definition) applies only to non-Tech Spec equipment and, therefore, answer choices 'C' and 'D' should be eliminated. Similarly, the Applicant should recognize that the standard to be applied for

Operability of these timers is the surveillance Acceptance Criteria. Therefore, the applicable Operability Codes is INOPERABLE, making choice 'B' correct and 'A' wrong.			
Technical References: Tech Spec LCO 3.3.5.1, ECCS Instrumentation EN-OP-104, Operability Determination Process			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-PROC, Objective 42.3			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(5)		

Examination Outline Cross-Reference	Level	SRO
262002 UPS (AC/DC) 2.2.19 Knowledge of maintenance work order requirements.	Tier #	2
	Group #	1
	K/A #	262002 2.2.19
	Rating	3.4
	Rev / Date	0 / 10-12-12

Question 92

Use your provided references to answer this question.

The plant is operating at rated power.

The output from the inverter section of 1Y97 has failed with the following:

- The Static Switch has failed to transfer (automatically and manually)
- The Manual Bypass Switch will not move from its NORMAL OPERATION position

As a result, essential Central Alarm Station (CAS) and Secondary Alarm Station (SAS) equipment has been lost.

Per EN-WM-100, Work Request Generation, Screening and Classification, what PRIORITY should be assigned to the Work Request for this failure?

A. Priority 1

B. Priority 2

C. Priority 3

D. Priority 4

Answer: **A**			

Explanation:

Refer to SOI 04-1-01-L62-1, Static Inverters System, specifically: Attachment VI, Table 2, pages 12 and 13 of 21. It is here that we see that the CAS and SAS equipment is impacted by the loss of this inverter. The SRO Applicant is expected to conclude from the stem that this loss constitutes a significant security deficiency. Refer to EN-WM-100, Attachment 9.1 (On-Line WR Priority Matrix). It is here that WR Priority is determined.

'A' is correct based on the left-most column (JOB TYPE) of the 2nd row. The SRO Applicant is expected to match up his conclusion of there being a "Significant Security Deficiency" with the 1st column of WORK TYPEs, where there is a RED-colored box…which applies because there has been a "Failure…with System Unavailable". The legend at the bottom of this Matrix indicates that RED corrective maintenance WRs are to be assigned a PRIORITY 1.

‘B’, ‘C’, ‘D’ are wrong for the reason ‘A’ is correct. Their plausibility is based on the Applicant’s need to correctly interpret the WR Priority Matrix.
Technical References: EN-WM-100, Work Request Generation, Screening and Classification 04-1-01-L62-1, Static Inverters System SOI
References to be provided to applicants during exam: EN-WM-100, the following pages: 1 through 11, and Attachment 9.1 (page 27, in color)
Learning Objective: GLP-OPS-PROC, Objective 26.6

Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental		
	Comprehensive/Analysis	X	
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(5)		

Examination Outline Cross-Reference	Level	SRO
217000 RCIC Ability to (a) predict the impacts of the following on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.01 System initiation signal	**Tier #**	2
	Group #	1
	K/A #	217000 A2.01
	Rating	3.7
	Rev / Date	1 / 11-14-12

Question 93

The plant is operating at rated power.

- RCIC auto initiates on an invalid Level 2 signal.
- Initiation logic seals in and will not reset.
- The reactor remains online.

Which of the following choices completes the following statements?

(1) The RCIC system must be secured by using _____.

(2) The CRS will direct entry into _____.

A. (1) Normal SOI Section 5.3 Shutdown of the RCIC System
(2) Power Operations IOI-2

B. (1) RCIC Hardcard for shutdown RCIC and maintain RCIC available
(2) Loss of Feedwater Heating ONEP.

C. (1) Normal SOI Section 5.3 Shutdown of the RCIC System
(2) Loss of Feedwater Heating ONEP

D. (1) RCIC Hardcard for shutdown RCIC and maintain RCIC available
(2) Power Operations IOI-2

Answer: B

Explanation:

With the initiation signal sealed in, the RCIC system can only be secured by using the hardcard the Normal SOI will not work because the RCIC valves will reopen after closed.
Per 05-1-02-V-5 Loss of Feedwater Heating, symptoms 4.5 RCIC injecting into the Reactor in Mode 1 and 04-1-01-E51-1, RCIC system SOI, Precaution and Limitation 3.24 If RCIC injects into the Reactor in Mode 1, enter the loss of feedwater heating ONEP.

For these reasons, only ‘B’ is correct.

‘A’ is wrong for the reason ‘B’ is correct. Plausible to the Applicant who thinks that normal SOI shutdown can be done with an initiation signal sealed in and unaware of the ONEP

symptom.

‘C’ is wrong for the reason ‘B’ is correct. Plausible for the Applicant who thinks that normal SOI shutdown can be done with an initiation signal sealed in.

‘D’ is wrong for the reason ‘B’ is correct. Plausibility is for the Applicant who is unaware of the ONEP symptom.

Technical References:

04-1-01-E51-1, RCIC SOI
05-1-02-V-5, Loss of Feedwater Heating

References to be provided to applicants during exam: None

Learning Objective: GLP-OPS-E5100, Objective 8.0
GLP-OPS-ONEP Objective 35

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(2)	

Examination Outline Cross-Reference	Level	SRO
400000 Component Cooling Water Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: A2.03 High/low CCW temperature	**Tier #**	2
	Group #	1
	K/A #	400000 A2.03
	Rating	3.0
	Rev / Date	0 / 10-12-12

Question 94

The plant is operating at rated power.

The CRS enters the Loss of PSW ONEP due to a partial loss of PSW.

When is the CRS expected to enter the Loss of CCW ONEP and implement it concurrently with the Loss of PSW ONEP?

(Assume each answer choice is due to a PSW system problem.)

A. Recirc Pump temperatures are rising.

B. CCW heat exchangers have been aligned to SSW.

C. EHC oil temperature is rising.

D. CCW system temperature cannot be maintained below 100°F

Answer: D

Explanation:

See Loss of PSW ONEP, section 3.2.15, where it directs operators to refer to the Loss of CCW ONEP if CCW temperature cannot be maintained < 100°F. Refer to the Loss of CCW ONEP, section 3.2.2 (partial loss subsequent actions), where the 3rd bullet acknowledges a partial loss due to inadequate PSW flow. The CRS is expected to enter this ONEP because of a partial loss of CCW and implement the actions beginning with section 3.2.2. For this reason, 'D' is correct.

'A' is wrong. Rising recirc pump temperatures by themselves is not a reason to enter the Loss of CCW ONEP (see the SYMPTOMS section for this ONEP, section 4.0). Plausible to the Applicant who does remember that the Loss of CCW ONEP does address the issue of recirc pump temperatures that are unable to be maintained below their alarm setpoints.

'B' is wrong. See the Loss of PSW ONEP, section 3.2.10, where entry into the Loss of CCW ONEP concurrent with the Loss of PSW ONEP is required ONLY if SSW cannot be supplied to the CCW heat exchangers. Plausibility speaks for itself.

‘C’ is wrong. EHC is a TBCW load, not a CCW load. See the Loss of TBCW ONEP (05-1-02-V-2), section 1.2. Plausible to the weaker Applicant who fails to associate EHC with TBCW rather than CCW.			
Technical References: 05-1-02-V-11, Loss of PSW ONEP O5-1-02-V-1, Loss of CCW ONEP			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-ONEP, Objective 2.0			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(5)		

Examination Outline Cross-Reference	Level	SRO
201005 RCIS 2.4.4. Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	Tier #	2
	Group #	2
	K/A #	201005 2.4.4
	Rating	4.7
	Rev / Date	1 / 11-14-12

Question 95

Which of the following valid annunciators, by itself, would cause the CRS to enter the Control Rod/Drive Malfunctions ONEP and what is the appropriate action?

A. HCU TROUBLE
Declare the HCU INOP per Tech Specs

B. CONT ROD WITHDRAWAL BLOCK
Determine the cause and restore

C. CONT ROD OVERTRAVEL
Obtain Reactor Engineering permission to recouple

D. SRM PERIOD
Restore period to >50 seconds by inserting control rods

Answer: C

Explanation:

'A' is wrong. See the ARI P680-4A2-D4, where there is no mention of even referring to this ONEP. Also see the SYMPTOMS (Section 4.0) of the ONEP, where this alarm does not appear as one of the SYMPTOMS.

'B' is wrong. See the ARI P680-4A2-C5, where there is no mention of even referring to this ONEP. Also see the SYMPTOMS (Section 4.0) of the ONEP, where this alarm does not appear as one of the SYMPTOMS.

'C' is correct. Refer to the ARI P680-4A2-E5 and ONEP SYMPTOMS, specifically 4.5, where we find that the validation of an uncoupled rod (which is done within the ARI itself) is one of the SYMPTOMS. The ONEP remedy is to obtain RE permission to recouple.

'D' is wrong. See the ARI P680-7A-C10, where there is no mention of even referring to this ONEP. Also see the SYMPTOMS (Section 4.0) of the ONEP, where this alarm does not appear as one of the SYMPTOMS.

'A', 'B', 'D' are all plausible this ONEP has many different types of entries, including those related to: CRDM problems, CRD Hydraulic problems, RC&IS problems, rod position indication problems, neutron monitoring indications that are not consistent with rod movement, etc.

Technical References: 05-1-02-IV-1, Control Rod/Drive Malfunctions ARI 04-1-02-1H13-P680-4A2-C5, -4A2-D4, -4A2-E5, and -7A-C10			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-ONEP, Objective 2.0			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(5)		

Examination Outline Cross-Reference	Level	SRO
2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	Tier #	3
	Group #	
	K/A #	2.1.5
	Rating	3.9
	Rev / Date	1 / 11-14-12

Question 96

Per Tech Spec 5.2.2, shift crew may be one less than the minimum requirement of 10CFR50.54 for a period of two hours…

A. only if the missing crew member is a non-licensed operator and immediate action is taken to restore the crew compliment.

B. only if the missing crew member is a non-licensed operator and action is taken to notify the NRC within 24 hours.

C. for any required crew member as long as immediate action is taken to restore the crew compliment.

D. for any required crew member as long as action is taken to notify the NRC within 24 hours.

Answer: C

Explanation:

Per the administrative requirements of TS 5.2.2, shift crew may be one less than any required crew member by 10CFR50.54(m)(2)(i). This section only addresses License Operators (RO/SRO) and does not specify any subtitle such as Shift Manager. The allowance is for two hours if immediate action is taken to restore crew compliment. For this reason answer C is correct.

Answers A & B are plausible since TS Table 7.2.2-1 lists non-licensed operators as a requirement for minimum crew manning. EN-OP-115 attachment 9.3 section 1 “Shift Manning” places additional limitations in that the positions listed in TS Table 7.2.2-1 including non-license operators must meet the two hour manning requirement along with the immediate action to restore.

Answer D is plausible if the applicant mistakes the reportability requirement for not meeting a license condition as being applicable if crew composition is restored within the 2 hour limit.

Technical References:

Tech Spec Administrative Controls Section 5.2.2
Technical Requirements Manual (TRM) Section 7.0 (including Table 7.2.2-1)
Conduct of Operations procedure, EN-OP-115, Attachment 9.3, Section 1.

References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-PROC, Objective 1.12			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(5)		

Examination Outline Cross-Reference	Level	SRO
241000 Reactor/Turbine Pressure Regulator Ability to (a) predict the impacts of the following on the REACTOR/TURBINE PRESSURE REGULATING SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.08 Main turbine overspeed	**Tier #**	2
	Group #	2
	K/A #	241000 A2.08
	Rating	3.3
	Rev / Date	1 / 11-14-12

Question 97

A reactor startup is in progress.

While synchronizing the main generator to the grid, the main turbine shaft speed reaches 1,992 rpm.

As a result…

A. (1) The Turbine Control and Stop valves close.
(2) The CRS will direct entry into the Scram and Turbine Trip ONEP's.

B. (1) The Turbine Control and Stop valves close.
(2) The CRS will direct entry into the Turbine Trip ONEP.

C. (1) Only the Turbine Control valves close.
(2) The CRS will direct the operator to open the Turbine output breaker immediately.

D. (1) Only the Turbine Control valves close.
(2) The CRS will direct the operator to raise generator load to between 75 and 150MW.

Answer: B

Explanation:

Per 04-1-03-N32-3, Turbine Actual Overspeed Trip Test step 7.1.15 states the turbine overspeed trip is 1980 rpm. The applicant must predict the impact of the given 1,992 rpm on the plant. The impact is a turbine trip only since the normal reactor scram on a turbine trip is bypassed when below 30% power (see 04-1-02-1H13-P680-7A-A1(B1) step 2.1). For this reason only the Turbine Trip ONEP will be entered.

If the applicant fails to realize the turbine should have tripped, then the answer choice of only the turbine control valves close is plausible since the stop valves will only close on a trip condition or if they are manually closed (see 04-1-02-1H13-P680-7A-B1, TURB SV CLOSE TRIP). In this case the applicant would assume normal turbine control valve operation in that they would close to slow the shaft rotation speed. Part two of answers C & D deal with what the CRS would do for an abnormal parallel or normal parallel respectively assuming no turbine trip for this condition.

Only answer B correctly identifies that both the turbine control and stop valves will close and that only the Turbine Trip ONEP is required.

Technical References:

04-1-03-N32-3, Turbine Actual Overspeed Trip Test
04-1-02-1H13-P680-7A-A1, TURB CV FAST CLOSE TRIP
04-1-02-1H13-P680-7A-B1, TURB SV CLOSE TRIP

References to be provided to applicants during exam:

NONE

Learning Objective: GLP-OPS-N3201, Objective 5

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(5)	

Examination Outline Cross-Reference	Level	SRO
2.1.34 Knowledge of primary and secondary plant chemistry limits.	Tier #	3
	Group #	
	K/A #	2.1.34
	Rating	3.5
	Rev / Date	1 / 11-14-12

Question 98

The plant is operating at rated power.

- Feedwater and Condensate conductivity is trending up but do not exceed limits.
- Reactor Water Conductivity is 7.2 umho/cm.

The CRS will…

A. (1) Enter Condensate/Reactor Water High Conductivity ONEP and TRM 6.4.1
(2) Restore reactor chemistry to within limits in 72 hours

B. (1) Enter Condensate/Reactor Water High Conductivity ONEP and TRM 6.4.1
(2) Manually scram the reactor

C. (1) Enter TRM 6.4.1, Only
(2) Restore reactor chemistry to within limits in 72 hours

D. (1) Enter Condensate/Reactor Water High Conductivity ONEP, Only
(2) Manually scram the reactor

Answer: B

Explanation:

See TRM 6.4.1, Table 6.4.1-1 for the Conductivity (upper) limit while in MODE 1…it is 1.0 µmhos/cm and the Condensate/Reactor Water High Conductivity ONEP is entered for rising conductivity. For the second part see 05-1-02-V-12, Condensate/Reactor Water High Conductivity ONEP, in Mode 1 step 3.6, If any of the following conditions exists (Reactor Water Conductivity > 5.0 umho/cm) then manually scram the reactor.

For this reason, only choice ‘B’ is correct.

‘A’ is wrong because although the TRM gives 72 hours to restore chemistry in MODE 1, the ONEP action to scram the reactor trumps the TRM allowance to restore and placing the Mode Switch to SHUTDOWN will place the plant in MODE 3. When this happens the TRM allowance is changed to 48 hours.

‘C’ is wrong for the same reason as answer A.

‘D’ is wrong because although the scram will place the reactor in Mode 3, there remains an

exceeded TRM limit for Mode 3 Conductivity of 2.0 umho/cm. Therefore the CRS must also enter TRM 6.4.1.			
Technical References: TRM 6.4.1, Chemistry 05-1-02-V-12, Condensate/Reactor Water High Conductivity ONEP			
References to be provided to applicants during exam: None			
Learning Objective: GLP-OPS-TSOV1, Objective 4			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(5)		

Examination Outline Cross-Reference	Level	SRO
2.4.29 Knowledge of the emergency plan.	Tier #	3
	Group #	
	K/A #	2.4.29
	Rating	4.4
	Rev / Date	0 / 10-12-12

Question 99

The plant is operating at rated power.

A plant event occurs.

The event meets the threshold for an ALERT level of the EALs but is rapidly concluded (i.e., event no longer exists) before the CRS/SM actually classify the event.

Per 10-S-01-1, Activation of the Emergency Plan, which of the following describes the classification and notification requirements?

A. Classify the event and make all of the normal notifications to offsite agencies, including the NRC.

B. Classify the event but notify only the NRC.

C. Do not classify the event and notify only the NRC.

D. Do not classify the event and do not make any notifications to offsite agencies, including the NRC.

Answer: A

Explanation:

See 10-S-01-1, Section 6.1.5.a, 1st bullet, where we are directed to both classify the rapidly concluded event and make all of the normal offsite agency notifications, including the NRC.

For the above reason, choice 'A' is correct.

'B' is wrong for the reason 'A' is correct. It is plausible to the SRO Applicant who cannot recall the Section 6.1.5 criteria.

'C' is wrong for the reason 'A' is correct. Its plausibility comes directly from Section 6.1.5.b and its 1st bullet.

'D' is wrong for the reason 'A' is correct. It is plausible to the SRO Applicant who cannot recall the Section 6.1.5 criteria.

Technical References: 10-S-01-1, Activation of the Emergency Plan			
References to be provided to applicants during exam: None			
Learning Objective: GLP-EP-EPTS6, Objective 8			
Question Source:	Bank #		
(note changes; attach parent)	Modified Bank #		
	New	X	
Question History:	Last NRC Exam	No	
Question Cognitive Level:	Memory/Fundamental	X	
	Comprehensive/Analysis		
10CFR Part 55 Content:	55.41(b)		
	55.43(b)(5)		

Examination Outline Cross-Reference	Level	SRO
295021 Loss of Shutdown Cooling / 4 2.1.20 Ability to interpret and execute procedure steps.	Tier #	1
	Group #	1
	K/A #	295021 2.1.20
	Rating	4.6
	Rev / Date	0 / 10-12-12

Question 100

Use your provided references to answer this question.

It is day 30 of RF18.

CORE ALTERATIONS are in progress with fuel being moved to the Spent Fuel Pool.

Regarding the status of the "decay heat removal capability" Safety Function:

- RHR 'A' Shutdown Cooling is currently OPERABLE and is operating in that mode
- RHR 'B' is currently Available for Shutdown Cooling but is not OPERABLE for the Shutdown Cooling mode
- ADHR is currently Available for decay heat removal is not OPERABLE
- There are no other decay heat removal methods (including natural circulation) currently available

There are no unusually complex evolutions in progress or any plant conditions which themselves represent an unusually high risk.

Then, RHR Pump 'A' trips on a motor overload and cannot be restarted.

What is the risk level color now assigned to the "decay heat removal capability" Safety Function?

A. Green

B. Yellow

C. Orange

D. Red

Answer: A			

Explanation:

See the Shutdown Operations Protection Plan (SOPP) for RF18. Stem conditions indicate that the SHUTDOWN CONDITION 3 portion of Section V applies here. See SOPP page 25, where Part 'B' (Shutdown Cooling), specifically its right-most box, sends us to the logic

diagram SDC-3 (which is on page 29). There, from left-to-right, we answer NO, then NO…and conclude that the risk color is still **GREEN** (because there are at least two SDC trains "available" (in this case, RHR 'B' SDC and ADHR, per the stem conditions), where "available" is defined by the Section III "Terms and Definitions" on page 6 of the SOPP).

For these reasons, choice 'A' is correct.

'B', 'C', 'D' are all wrong for the reason 'A' is correct. Plausibility of each speaks for itself.

Technical References:

Shutdown Operations Protection Plan (SOPP)

References to be provided to applicants during exam:

SOPP in its entirety

Learning Objective: GLP-OPS-SOPP-RF18, Objective 7

Question Source:	Bank #	
(note changes; attach parent)	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	X
10CFR Part 55 Content:	55.41(b)	
	55.43(b)(5)	